

United
States
Department
of
Agriculture

Forest
Service

May 2020



Environmental Assessment

Sanpoil

Republic Ranger District, Colville National Forest

Ferry County, Washington

Travis Fletcher, District Ranger

Republic Ranger District

650 East Delaware Ave, Republic, WA, 99166

(509) 775-7400

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer and lender

1.0 Introduction

The Sanpoil project is located north of the Colville Indian Reservation, east of Highway 21, south of Highway 20, and is roughly 1 mile south of Republic, Washington. The project is on the Republic Ranger District of the Colville National Forest in an area that contains a mix of vegetation types. Special features include the Bald Snow, Thirteen Mile, and Cougar Mountain Inventoried Roadless Areas (IRA); the Sanpoil River, wildland urban interface (WUI), and key ingress/egress routes including McMann Creek and Hall Creek Roads. The legal description of the area is T35N R32E Sections 24, 25, 36; T35N R 33E Sections 1-36; T35N R34E Sections 1-10, 15-22, 27-35; T36N R33E Sections 17, 20, 21, 25-29, 32-36; T36N R34E Sections 27-36. Figure 1 shows the approximately 47,956 acre project area situated on the Republic Ranger District of the Colville National Forest.

The Sanpoil project lies in the heart of ceded lands commonly called the North Half, which includes the Colville National Forest west of the Columbia River. In this area, the ceded land rights and privileges of the Confederated Tribes of the Colville Reservation will be considered and appropriately provided for in all Forest activities. With the Executive Order which established the Colville Reservation in 1872, tribal members were given specific rights. Among those rights are hunting and fishing. An Act of July 1, 1892, restored the north one-half of this reservation to public domain. However, the United States (U.S.) Supreme Court in the Antoine Decision of 1975 determined that the tribal members' rights to hunting and fishing were retained through this transaction. These rights will be considered through management of appropriate resources such as fish, wildlife and riparian areas (LMP 75).

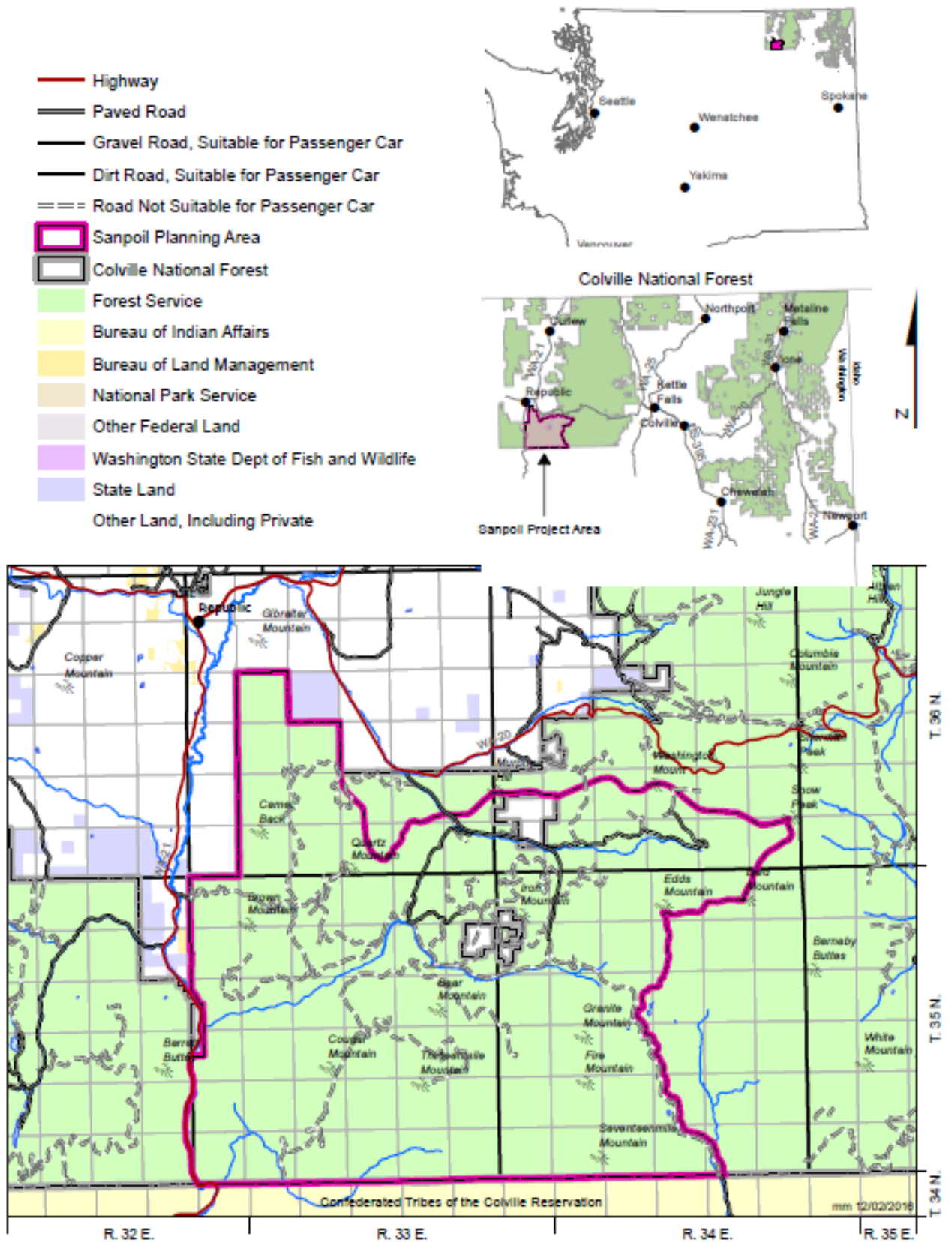
Values at Risk in and around the Sanpoil project area include:

Watersheds, private forests, ranches, communication towers, IRA, and high use recreation areas such as the 13 mile trail and the Kettle Crest.

The project falls within an area designated as a Collaborative Forest Landscape Restoration Act (CFLRA) Project. There are several purposes of the law, many of which apply directly to the Sanpoil project including: “encouraging ecological and social sustainability, facilitating the reduction in wildfire management costs by...reducing the risk of uncharacteristic wildfire, and use of forest products to offset treatment costs while benefitting local rural economies” (section 4001 Omnibus Public Land Management Act of 2009).

We prepared the Sanpoil Environmental Assessment (EA) to determine whether implementation of the proposed activities would significantly affect the quality of the human environment. For more details of the proposed action, see section 2.2. Proposed Action.

Figure 1. Sanpoil Vicinity Map



1.1 Document Structure

This document is organized into the following four parts:

- Introduction. Section 1.0 describes the background of the project proposal, its purpose and need, the management direction for the project area, the public involvement process, and the scope of environmental analysis for this EA.
- Alternatives including the Proposed Action. Section 2.0 describes the alternative methods developed and considered to achieve the purpose and need, and the proposed action developed to achieve the purpose and need.
- Environmental Consequences. Section 3.0 describes the potential effects of implementing the proposed action with analyses organized by resource and then focused on the potentially significant issues.
- Agencies and Persons Consulted. Section 4.0 lists the agencies and persons consulted.

1.2 Purpose and Need for Action

1.2.1 Forest Health and Resilience

There is a need to promote forest health and resiliency within the planning area to foster conditions that are less prone to disturbance events including insects, disease, and wildfire. Treatments are needed to reduce tree density, increase stand vigor, and decrease the potential for insects, disease, and large wildfires. Treatments would be designed to respond to insect and disease pressures created by wildfires, wind throw, and overstocked stands.

Densely stocked stands in the project area compete for light, water, and nutrients, with droughts aggravating competition for water. Such conditions are causing trees to be less vigorous with increased vulnerability to disturbances. These conditions have resulted in mountain pine beetle and western spruce budworm outbreaks, which have been ongoing since 2011. The 2015 Northstar wildfire, which burned areas just west of and adjacent to the project area will likely cause Douglas-fir beetle outbreaks if such conditions remain the same. The 2019 Colville National Forest Land Management Plan (LMP) emphasizes consideration of integrated pest management strategies (LMP 90), changes due to wildfire (LMP 34) and managing stands for vigorous growth.

1.2.2 Water quality, watershed function, and aquatic habitat

The Sanpoil area provides important habitat for fisheries and aquatic-dependent species with water from the project area draining into waterways on the Colville Indian Reservation as well as private land. Project treatments would be designed to maintain or improve aquatic habitats through coordination with other management activities (LMP 120). Where management activities have caused degradation, treatments would be designed that work toward rehabilitation (LMP 31 and 53). The LMP directs managers to provide for the continued supply of high quality water, riparian plant communities which maintain a high level of riparian dependent species, and a diversity of high quality aquatic habitats which ensure viable populations of fish (LMP 50 to 52). The Sanpoil project area, including the Upper Sanpoil watershed, are a high priority for watershed restoration (R6 Aquatic Restoration Strategy, National Watershed Condition Framework (WCF), LMP 53). The watershed action plan for the Upper Sanpoil and the West Fork Sanpoil rivers provides a restoration strategy to fulfill high-priority actions to address limiting factors affecting fish populations and habitat, water quality, soil quality, and overall watershed function and condition.

1.2.3 Support infrastructure and jobs in the Tri-County area

Timber production plays an integral role in the economies of local communities (LMP 87). The Sanpoil project would yield wood fiber and saw log material that would help meet local demand from small purchasers as well as log mills in the Tri-County area. The LMP directs forest managers to provide for the sustained production and utilization of wood fiber in the various product forms, consistent with the multiple-use objectives of the LMP (LMP 87). Much of the project area falls into management areas aimed at achieving optimum production of timber products while protecting basic resources (LMP 109). Other management areas direct the management of timber resources in a way that is consistent with and supports other values and goals such as recreation (LMP 99, 130 and 149), wildlife (LMP 106), and winter range (LMP 99).

What is Resilience?

The Forest Service Manual defines resilience as the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change (FSM 2000 Chapter 2020.5).

In their paper “Basic principles of forest fuels reduction treatments” Agee and Skinner define resiliency as a forest capable of maintaining substantial live basal area after being burned by a wildfire (2005).

Fitzgerald defines fire-resiliency as the ability of ponderosa pine forests to survive wildfires relatively intact, as typically occurred during pre-settlement times (2005).

In the context of this site-specific project, resiliency is considered *the ability of a forested area to survive a disturbance event, specifically wildfire and insect attack, relatively intact and without large scale tree mortality*. By using the term “relatively intact,” this recognizes that the intent of the proposed treatments is not to fire-proof the area, but to set the area on a trajectory to where natural processes such as fire and insects can play a role in the system without causing large scale mortality.

1.3 Management Direction

The LMP provides guidance and direction for management on the Colville National Forest, including the Sanpoil project area. This EA incorporates the LMP by reference and is tiered to the Land Management Plan’s Final Environmental Impact Statement (USDA Forest Service 2019). LMP documents are available online at the Colville National Forest Website at: <https://www.fs.usda.gov/main/colville/landmanagement/planning>.

The LMP establishes desired conditions, objectives, and standards and guidelines at the forest level as well as on a management area specific basis. The Sanpoil project area includes several management areas, as displayed in Table. 1 which states briefly the management area goals and objectives. In addition to following specific direction provided for each management area, this project would be consistent with LMP direction regarding forest wide desired conditions, objectives, and standards and guidelines (LMP 12 to 16 and 27 to 91).

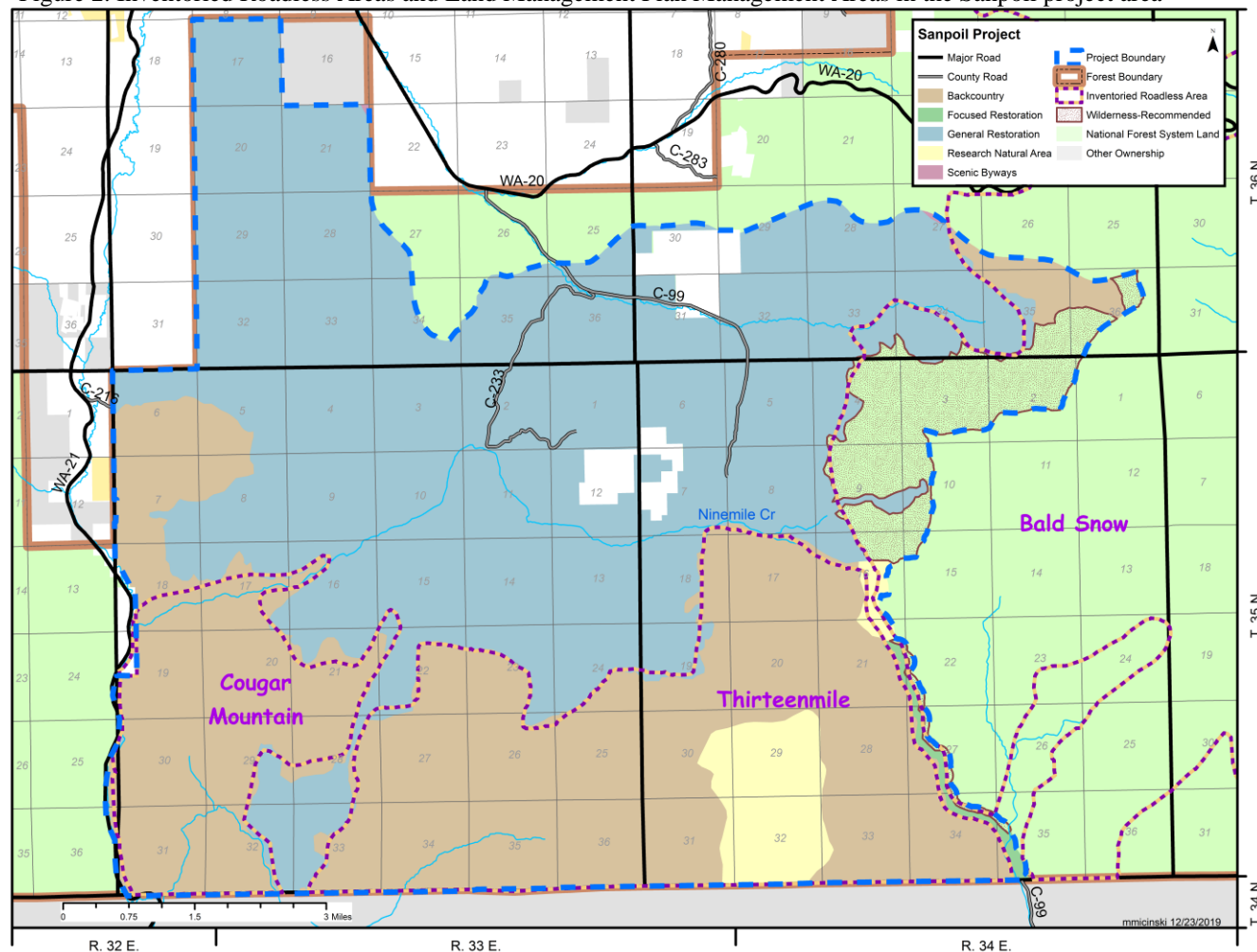
Table. 1 Management Areas in the Sanpoil Project Area, Descending Order of Prevalence

2019 LMP Management Areas*	Summary of Goals/Objective	Acres in Project Area	Percent of Project Area
General Restoration	Emphasis is on providing landscape composition, structure, and pattern that supports desired conditions for vegetative systems, aquatic, plant, and wildlife habitats. Landscape alteration will utilize a combination of ecological processes and management activities in order to achieve these desired conditions.	25004	52%

Backcountry	Emphasis is on summer and winter non-motorized recreation. Landscape should be predominately natural-appearing with some alterations that contribute to the recreational setting, such as openings created or retained for scenic views.	17603	37%
Wilderness-Recommended	Emphasis would be on protecting wilderness characteristics until Congress either designates the area as part of the National Wilderness Preservation System or the area is released from consideration.	2526	5%
Research Natural Areas (RNA)	Emphasis on maintaining a relatively unaltered state for non-manipulative research, observation, and study. Management activities must be consistent with the purposes for which the RNA was established or proposed.	1622	3%
Focused Restoration	Emphasis is to restore ecological integrity and ecosystem function at the landscape scale. A combination of active and passive management would be used to increase resilience and restore natural processes.	209	Less than 1%
Scenic Byways	Emphasis on protecting scenic value and recreation use. These areas have a high scenic integrity objective.	14	Less than 1%
Administrative and Recreation Sites	Emphasis on functionality of sites regarding human health, safety, and usability being maintained while meeting objectives of other plan components applicable to the area's natural setting.	*	*
Riparian Management Areas (RMA)	Emphasis on management activities designed to benefit aquatic and riparian-dependent resources and move the landscape towards desired conditions.	*	*
Private Lands	A few blocks of private land exist in the project area they are mostly forested, and in a few cases contain structures.	978	~2%
Total		47,956	100%

*Administration and Recreation Sites, and RMA both occur within the project area and overlay management areas listed above. These areas will be managed in a manner that is consistent with the LMP and their compatible uses.

Figure 2. Inventoried Roadless Areas and Land Management Plan Management Areas in the Sanpoil project area



1.3.2 Inventoried Roadless Areas

The Bald Snow, Thirteen Mile, and Cougar Mountain IRA fall completely or partially in the Sanpoil project area, (see Figure 2). These roadless areas were identified in the 2001 Roadless Area Conservation Rule and mapped in the Roadless Area Conservation FEIS (November 2000). The areas were set aside through administrative rulemaking with provisions for the protection of IRA 36 CFR 294.11. Treatments planned in the IRA would cut trees of generally small diameter. The purpose of cutting trees would be for “maintaining or restoring the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period” 36 CFR 294.13(b)(1). The project would maintain or improve the roadless area characteristic of, “habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land,” as defined in § 294.11(4).

The following items are used to describe the effects to IRA because these values and features often characterize roadless areas (36 CFR 294.21):

1. High quality or undisturbed soil, water, and air
2. Sources of public drinking water
3. Diversity of plant and animal communities
4. Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land

5. Primitive, semi-primitive, non-motorized and semi-primitive motorized classes of dispersed recreation
6. Reference landscapes
7. Natural-appearing landscapes with high scenic quality, natural integrity, and apparent naturalness, solitude and remoteness
8. Traditional cultural properties and sacred sites, and
9. Other locally identified unique characteristics or special features.

1.3.3 Other Guiding Documents

Tribal Forest Protection Act of 2004 (TFPA)

The project was proposed under the TFPA, in an area designated as a priority for treatment by the Healthy Forest Restoration Act. TFPA is a tool for restoring land managed by the United States Forest Service (USFS) and protecting tribal trust forest lands and resources from threats coming from national forests. TFPA projects are intended to restore national forestlands in order to reduce threats such as wildfire, insects, and disease that pose a risk to tribal trust lands. The TFPA authorizes the USFS to give special consideration to tribal proposals for work conducted on USFS administered land requiring restoration or posing a risk to trust assets.

Planning in the Sanpoil project is moving forward under the authority of the TFPA. TFPA authorizes the Secretary of Agriculture to enter into an agreement or contract with Indian Tribes to carry out projects on National Forest System (NFS) lands to protect Indian forest land, rangeland, or tribal communities. Additionally, TFPA allows the USFS to use a best-value basis and give specific consideration to tribally-related factors in the proposal for any contracts or agreements that may result from project analysis.

Watershed Condition Framework

In 2010, the national forests throughout the U.S. were mandated to assess the current condition of NFS watersheds utilizing the WCF. The results of the WCF were used to identify priority subwatersheds where focused management over a 5- to 10-year period would improve impaired watershed condition. Ninemile Creek is one of three priority subwatersheds identified on the forest through this process. Improvement in watershed condition is measured by the completion of essential projects.

Northeast Washington Forest Vision 2020 (Vision 2020) & Collaborative Forest Landscape Restoration Act

The Northeast Washington Forestry Coalition has been active on the Colville National Forest for over 20 years. In 2009 this group played an active role in helping develop a proposal which won federal funds from a program called the CFLRA. The Colville's proposal is called Vision 2020 and includes guiding principles and goals for planning projects over the 10 year life of the CFLRA program.

The Vision 2020 project area encompasses a 916,000 acre landscape which covers most of the Colville National Forest west of the Columbia River and includes 497,583 acres of National Forest lands. Projects planned under the Vision 2020 proposal include Deer Jasper, Sherman and Orient. Projects in the planning phase include Sanpoil and Bulldog.

The Vision 2020 CFLRA landscape restoration strategy will increase ecosystem resistance and resilience to disturbance, restore old-growth structure and function, and reduce wildfire risk and fire management costs by: 1) thinning small trees, reducing fuel loads and ladder fuels; 2) increasing fire breaks through landscape heterogeneity; 3) employing fire as a management tool; and 4) establishing a low-fuels buffer on the northern boundary of the Colville Indian Reservation (CFLRA Proposal Page 2). Additional information about the Vision 2020 proposal can be found on the web at: <https://www.fs.fed.us/restoration/documents/cflrp/2011/Proposals/Region6/Colville/NEWForestVisionCFLRP2020ver2.pdf>.

Community Wildfire Protection Plans (CWPPs)

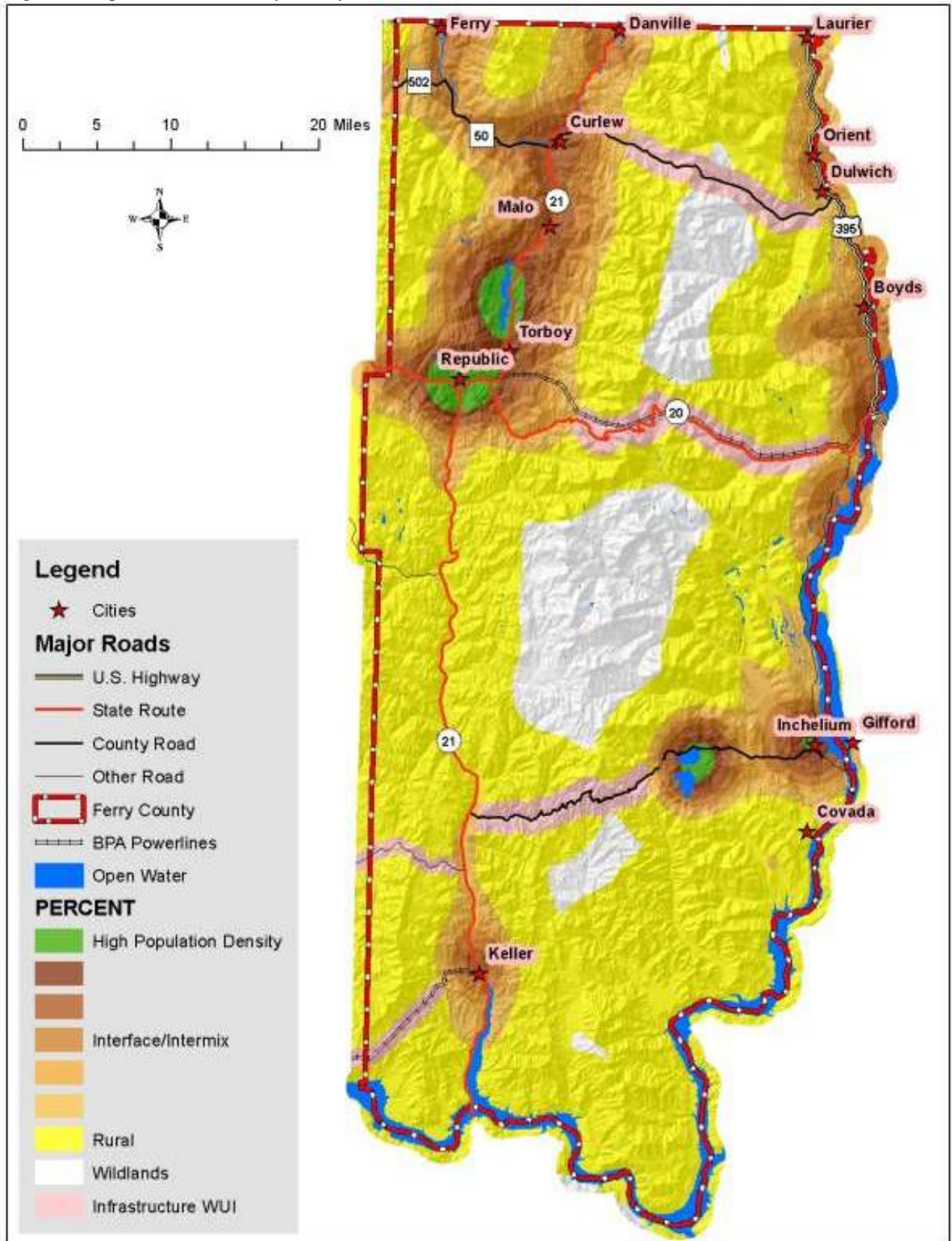
The Sanpoil Project area falls under the Ferry County CWPP. In 2014 Ferry County updated their CWPP. In part, the mission of the CWPP is to identify prioritized areas for hazardous fuel reduction treatments on Federal, State, and private land and to build on existing efforts to restore healthy forest conditions within the county (Tucker, B & V. Bloch, 2014). WUI areas are defined as areas where humans and their development meet or intermix with undeveloped wild areas that may be vulnerable to forest or rangeland fires. Three of the WUI conditions recognized by the CWPP are within the Sanpoil project area: Interface, intermix and rural (Tucker, B & V. Bloch, 2014).

Table 2. Types of Wildland Urban Interface in the Sanpoil project area as described in the Ferry County CWPP

Type of Wildland Urban Interface	Description from Ferry County CWPP
Intermix	A situation where structures are scattered throughout a wildland area. There is no clear line of demarcation; the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres.
Interface	A situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre.
Rural	Where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.

Rural condition WUI occurs for a mile on both sides of the roadway along Highway 21. For more information see the Ferry County CWPP at: https://www.ferry-county.com/PDF_Files/Commissioners/2014%20Ferry%20County%20CWPP%20Update.pdf

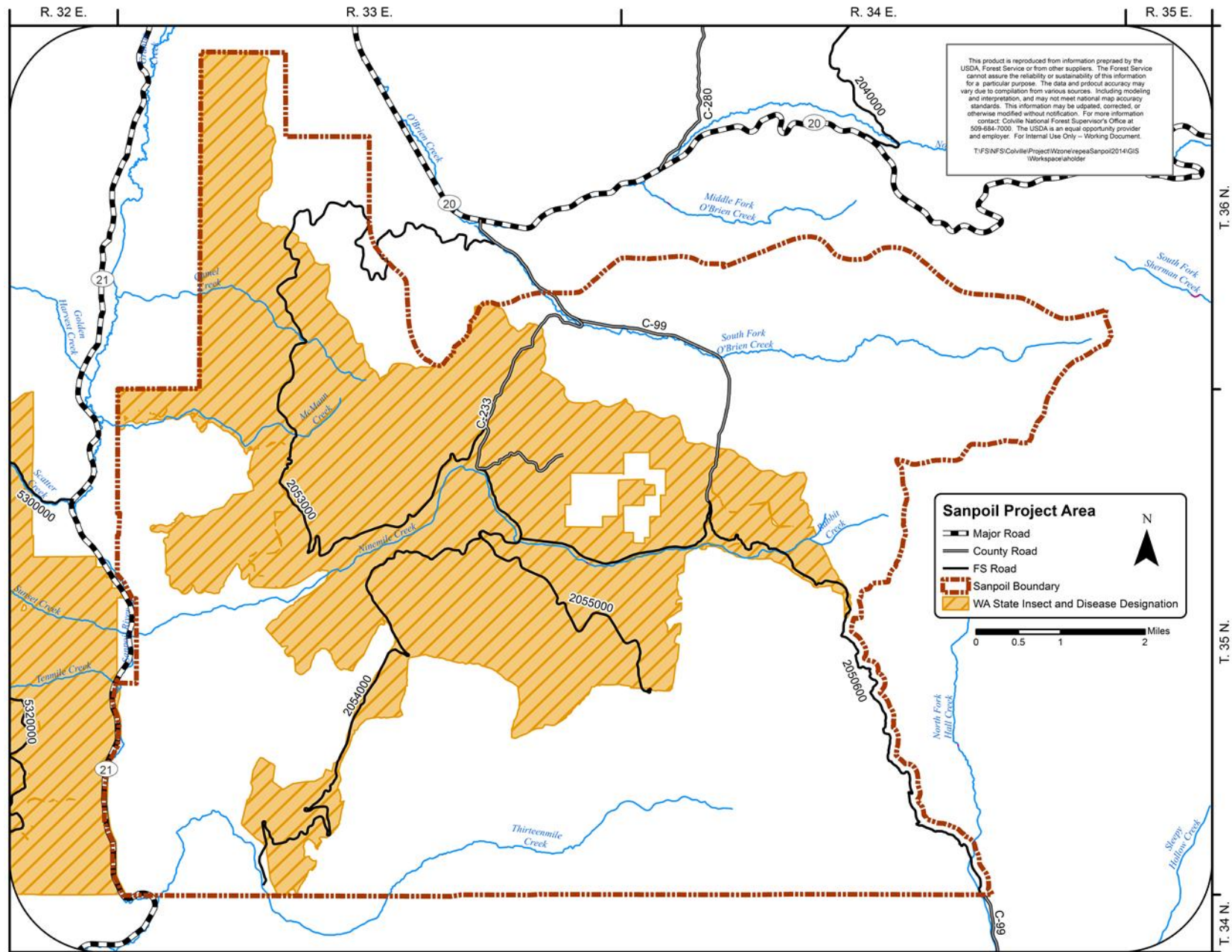
Figure 3. Map of WUI in the Ferry County CWPP



Insect and Disease Area Designation (2014 Farm Bill)

Much of the project area was selected as an Insect and Disease Area Designation under the 2014 Farm Bill by request of the Governor due to epidemic levels of bark beetles (Agricultural Act of 2014, Section 8204 of the Farm Bill). These areas were selected to address insect and disease threats that weaken forests and increase the risk of forest fire. Areas designated for treatment under the Insect and Disease provision of the Farm Bill must meet at least one of the following criteria: experiencing declining forest health; at risk of experiencing substantially increased tree mortality over the next 15 years due to insect and disease infestation based on the National Insect and Disease Risk Map; or an area where hazard trees pose imminent risk to public infrastructure, health or safety. See section on Alternatives Considered and Eliminated from Detailed Study for more information on this authority.

Figure 4. Insect and Disease Risk Map



1.4 Public Involvement

On July 9th, 2014 the Confederated Tribes of the Colville Reservation requested that the USFS enter into an agreement under the TFPA to plan activities in the Sanpoil project area. On October 24, 2014 the Pacific Northwest Region's Regional Office accepted the TFPA proposal. Section 106 tribal consultation was initiated with all tribes on December 9, 2016; coordination with the Confederated Tribes of the Colville Reservation has been ongoing. A scoping letter and legal notice in the paper were issued to the public on December 14, 2016, the scoping period ended on January 31, 2017.

The project has been on the Schedule of Proposed Actions on the Forest website since January 2017. The Colville National Forest publishes the SOPA quarterly on the web and sends the document to individuals, groups and industry representatives. The Spokane Tribe submitted comments as did the Confederated Tribes of the Colville Reservation.

The following organizations submitted comments during the initial scoping period: Alliance for the Wild Rockies, Sierra Club Upper Columbia River Group, WildLands Defense, US Environmental Protection Agency Region 10, American Forest Resource Council, Kettle Range Conservation Group, Northeast Washington Forestry Coalition, and Conservation Northwest. Comments included feedback on topics such as riparian treatments and water quality. All correspondence and full text of letters received are in the analysis file for the Sanpoil project in the electronic project record. The USFS provided periodic updates to the Northeast Washington Forestry Coalition at many of their quarterly meetings between 2016 and 2018.

The draft EA was published for a 30-day comment period starting February 6, 2019 with a legal notice in the Ferry County View. Ten comments were received during the 30-day comment period for the draft EA. Comments were received from the Alliance for the Wild Rockies, American Forest Resource Council, Confederated Tribes of the Colville Reservation's Fish and Wildlife, Confederated Tribes of the Colville Reservation's Tribal Historic Preservation Officer, Northeast Washington Forest Coalition, Reed Heckly, Sierra Club Upper Columbia River Group, Spokane Tribe, Stevens County Commissioners, Stuart Buck, and Washington State Department of Natural Resources. All comments were considered. We also sent comment response letters to better document consideration of some of the comments received from the American Forest Resource Council, Northeast Washington Forest Coalition, and Jeff Juel on behalf of the Alliance for the Wild Rockies and Sierra Club Upper Columbia River Group. Those response letters are available online at: <https://www.fs.usda.gov/project/?project=50741>.

See the Sanpoil decision notice for more detailed information regarding public involvement for the Sanpoil project.

1.5 Scope of Environmental Analysis and Issues

The responsible official and interdisciplinary team (IDT) reviewed public scoping comments and the existing conditions information from the IDT. The analysis was focused on the measurement indicators connected to the purpose and need, as described in Section 1.2. Additionally, analysis was completed for other resources (summarized in Section 3.0) to help determine if effects from the proposed action would be significant.

2.0 Proposed Action and Alternatives

This chapter describes the proposed action and the alternatives considered for the Sanpoil Project. This chapter outlines project design elements included with the proposed action to ensure compliance with LMP standards and guidelines, and laws and regulations.

The two alternatives that were considered during effects analysis were:

- Alternative 1 – No Action: The no action alternative would result in no activities being implemented

within the Sanpoil project area. See section 3.0 and specialist reports for analysis of the impacts from this alternative.

- Alternative 2 – Proposed Action: The proposed action alternative would result in the implementation of some or all the activities described in the EA. If the responsible official decides not to implement any of the proposed activities as listed in the EA then the decision notice for the Sanpoil project would include what activities would not be implemented and a rationale for why the decision maker chose not to implement. See section 3.0 and specialist reports for analysis of the potential impacts for this alternative.

2.1 Alternatives Considered but Eliminated from Detailed Study

2.1.1 Insect and Disease Categorical Exclusion (CE) Analysis

The IDT considered designing this project to meet the 2014 Insect and Disease Area Designation CE. Much of the project area was selected as an Insect and Disease Area Designation under the 2014 Farm Bill by request of the Governor due to epidemic levels of bark beetles (Agricultural Act of 2014, Section 8204 of the Farm Bill). These areas were selected to address insect and disease threats that weaken forests and increase the risk of forest fire. The Sanpoil area clearly meets the criteria to use this authority including experiencing declining forest health and is at risk of experiencing substantially increasing tree mortality over the next 15 years based on the Insect and Disease Risk Map (Figure 4). Choosing to use this authority would have resulted in a treatment limit of 3,000 acres. Less than half of the treatments needed in Sanpoil could have been included if we used this authority. Additionally, this authority does not include provisions to allow landscape burning to treat historically high fuel loadings or allow for other sale area improvement projects proposed in chapter 2. For these reasons the responsible official chose not to use this authority to categorically exclude this project from documentation in an EA.

2.1.2 Large-Scale Prescribed Burning

During project development the IDT considered the scale and placement of landscape burning treatments. The team looked at larger areas for potential burning including burning nearly all the IRA as well as larger burn blocks. The amount and size of landscape burns that can be accomplished are limited by several factors including the likelihood of burn windows (fuel moisture and weather patterns) lining up with firefighter and resource availability to staff large burns. About 8,700 acres of underburning and nearly 8,200 acres of pile and burn treatments are planned in Sanpoil, which provides a realistic assessment of what will be possible to accomplish during the life of the document. In order to conduct burns, areas must be reviewed for heritage, native and invasive plants, and wildlife concerns. These efforts to survey and analyze cost money and require time for analysis. The responsible official decided to focus burning treatments where they are most needed in order to match available survey crews and analysis workload with needed treatments.

2.1.3 No New Temporary Roads

The IDT considered an alternative that included no temporary road construction. This alternative would likely not sufficiently address the purpose and need. The reduction of hazardous fuel conditions would not take place in sufficient amounts or in some of the identified strategic locations along the highway, key ingress and egress routes, and along the edges of large burn blocks. Without control treatments along the edges of landscape burns, treatment could not safely take place. Without these treatments, existing fuel buildup could not be reduced to mimic historic conditions. The project would not be able to accomplish aspects of the purpose and need. There would be a substantial reduction in the amount of wood products and economic benefit in the Tri-county area. Fewer stands would be treated to improve forest health and resilience and encourage young vigorous growth into the future.

If no temporary road construction were included in the Sanpoil Project, a good portion of 2,472 acres on about 40 units; or nearly 40% percent of vegetation treatments would not take place. Complementary restoration treatments such as pre-commercial thinning and fuels reduction would likely not occur. Many of the units with proposed temporary roads are in areas that were chosen because they are WUI areas identified in the CWPP for

Ferry County. Many of these units fall along or near key ingress and egress routes that if treated can help provide safe movement in and out for residents, Colville Confederated Tribal members, firefighters, and recreationists.

2.1.4 Pacific Northwest Trail (PNT) Tie to Republic - Trail Designation

Commenters requested consideration of a trail tie between the proposed PNT and the town of Republic. However, since the PNT corridor was designated by Congress, this type of proposed re-route would need to be decided on by the PNT Advisory Council as it completes the comprehensive plan for the trail, which will, in part, identify where the trail will be located and constructed. Therefore, the Sanpoil Project, signed by the District Ranger, would not be the correct decision document in which to change the designated PNT route.

2.1.5 Drop Treatments Planned in the Inventoried Roadless Area

Treatments would be designed to meet the 2001 IRA Rule. This portion of the Sanpoil project meets the following criteria:

- The timber to be harvested is of “generally small diameter.”
- The cutting of trees is needed for the purpose of “maintaining or restoring the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period” 36 CFR 294.13(b)(1).

The landscape burning and associated cutting of trees maintains or improves the roadless area characteristic of, “habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land,” as defined in § 294.11(4). Large landscape burns would improve habitat for several sensitive species that depend on open forests. Habitat for grizzly bear and big game would also be improved through the increase in forage quantity and quality after burning. The improvement in habitat for big game in turn provides benefits to wolverine and grey wolves as big game are food sources for these species. The roadside ladder fuel reduction are required to build the “box” from which landscape burns can be accomplished. These treatments would be designed to minimize cutting trees in order to preserve cover in important wildlife corridors

Because this portion of the Sanpoil project fits within the purpose of tree cutting in the IRA, exemptions for cutting, and improves or maintains at least one of the characteristics of IRA, it was included in the proposed action for additional detailed consideration. Additionally, this part of the project helps achieve the purpose and need of promoting forest health and resiliency within the planning area to foster conditions that are less prone to disturbance events including insects, disease, and uncharacteristic wildfire.

2.2 Proposed Action

Table 3. Acres of Treatments

Silviculture Treatments	Acres
Commercial Thinning	3,846
Commercial Thinning with Openings	1,270
Pre-commercial Thin	2,520
Small Pine Thinning	519
Shelterwood Treatments	255
Total Silviculture Treatment Acres	8,410
No Silvicultural Treatment	39,546
Project Acres	47,956
Fuels Treatments	Acres
Shaded Fuel Break	2,270
Ladder Fuel Reduction	30
Machine Pile, Burn	7,256

Hand Pile Burn	444
Hand Pile, Burn / Machine Pile, Burn	463
Underburning (Includes Eagle Rock Maintenance and Landscape Natural Fuels)	8,666
Total Fuels Treatment Acres	19,129*
Roads	Miles
System Road Decommissioning	2.6
New Temporary Roads	3.65
Temp Road Use of Existing Templates	7.97
Restoration of Existing Non-System Templates	67
New road construction	0.25

*Some fuels treatments listed in this table overlap, total acres does not represent unique acres treated.

2.2.1 Silvicultural Treatments

Variable Density Commercial Thinning (CT)

Treatments would target the smaller less vigorous trees and those infested by pathogens. This treatment will remove suppressed, intermediate and co-dominant trees, as well as genetically inferior trees left by past diameter limit cuts and trees with forest pathogen infestations. Existing individuals and tree-clumps of healthy overstory will remain in the residual stand. The understory would be treated to isolate patches of multi-strata ladder fuels and open other areas to form single story structure. Following this treatment, the stand will remain fully stocked and no planting is expected.

Commercial Thinning with Openings for Insect and Disease (CT-O)

This is similar to the variable density thinning but because of moderate-to-high levels of insect or disease within the units, small group openings will be created over up to 50% of the unit to reduce future ground fuel accumulations and increase the stands ability to withstand disturbance. Openings would be located in areas of insect and disease or very poor vigor (mainly dwarf mistletoe, root rot, and bark beetles). Understory would be treated to reduce ladder fuels. Openings may be planted with fire resistant larch or ponderosa pine especially in areas where these species are lacking due to past management. This will add species diversity and resiliency to the stand.

Small Pine Thinning (SPT)

This treatment is also a variable density thin similar to above, but these stands may be of only marginal commercial viability. These stands have pockets of mortality due to *Ips* and bark beetles (mainly Mountain Pine BB). Planting may occur if needed to attain full stocking levels. Diameter at breast height in these units is approximately 4-12 inches. Units may include areas of pre-commercial only treatment as well. These stands are approximately 40 year old planted ponderosa pine stands. In such stands, openings may occur, and the size will be reliant on current mortality, but is not expected to be more than 30 percent of the stand.

Shelterwood Treatments (HSH)

Several stands have insect and disease rates high enough to greatly limit the selection of leave trees. Suitable trees may be left as clumps or individuals, and generally well-distributed throughout the stand where they currently exist.. Shelterwood with reserves will be used in the Sanpoil project where there are some large, old remaining ponderosa pines at rates of 2-5 trees per acre. These large remnant trees are few on the landscape. The rest of the stand stocking is made of grand fir and lodgepole pine mostly of less than 100 years old and typically infected with dwarf mistletoe and root rot. This prescription will release the remnant trees and regenerate ponderosa pine in the stand as a regeneration cut. The overstory ponderosa pine will not be removed.

Precommercial Thin (PCT)

Precommercial thinning is called for in non-merchantable stands that are overly dense (beginning to self-prune and lose vigor) or diseased stands where the majority of the trees are less than 7" DBH. The treatment would

leave the largest, most vigorous disease free trees for the residual stand. Thinning the overstocked stands reduces the time needed to attain late structure, increases vigor (thereby reducing the susceptibility to disease), and can reduce the long-term probability of fire damage. Overstory trees that are spreading dwarf mistletoe may be girdled, felled or pruned to reduce spread to the understory. Girdling and felling of dwarf mistletoe infected trees would not be applied to trees over 20 inches DBH. The pre-commercial thinning treatments are located in old harvest units and plantations.

2.2.2 Fuels Treatments

Ladder Fuel Reduction (LFR)

Ladder fuel reduction is used to meet fire management objectives. Ladder Fuels Reduction involves mechanically cutting understory trees 10" DBH and differs from PCT because it reduces the number of trees that are acting as ladders of fuels between the surface and the upper canopy. The desired stocking of remaining small trees varies and is dependent on the overall stand density and structure. LFR treatments are designed to reduce ladder fuels, thus reducing the potential for crown fire initiation and improving firefighter's ability to control fires by keeping predicted flame lengths at four feet or less. A variety of methods may be used to complete LFR. Methods include hand felling with chainsaws, the removal of small diameter trees with a feller-buncher or the mulching of understory trees with a boom mounted or vertical shaft mastication head. LFR may be completed during the same entry as a commercial harvest. For example, a feller buncher could cut the small diameter trees and the commercial material at the same time as the overstory harvest.

Shaded Fuel Break Treatments (SFB)

Shaded fuel breaks would be created by reducing canopy and surface fuels in areas of strategic importance for wildfire containment. Standing live or dead conifers would be thinned to a spacing of 5-15 feet between the crowns of individual trees or small groups of trees. Deciduous shrubs and trees that tend to moderate potential fire behavior, would be retained to the extent practicable and are expected to benefit from conifer thinning. Trees and existing surface fuels may be masticated using machines or felled by hand (chainsaw) or machines. Where feasible commercial products may be removed using ground based mechanized equipment. Slash would be piled by hand or machine and burned. Preference for tree retention would be based on tree species, crown quality, and/or canopy base height. Larger trees with thicker bark, higher crowns, and/or fuller, vigorous crowns would be preferred for retention. (Fire, Fuels & Air Quality report, p.8). Section 1.3.2 of the EA includes additional information about the requirements for cutting trees within an IRA.

Underburning

Underburning involves controlled burning of surface fuels in order to reduce fuel loading. There are three different reasons to conduct underburning in the Sanpoil project which include: Underburning as a follow up maintenance treatment, underburning of fuels generated by timber sale treatments in project harvest units, or underburning to reduce natural fuels buildup not associated with harvest treatments.

Underburning as a Maintenance Treatment (UB)

The desired goal of maintenance underburning is to maintain conditions, using prescribed fire, that reduce extreme fire behavior and allow fire personnel to safely suppress a wildfire start, and maintain a historic fire regime in the project area. Surface fuels would be light, reducing potential surface fire severity. Open timber stands would reduce the potential for sustained crown fires. Crown base heights would be increased through the use of prescribed fire by pruning trees with low-hanging branches. Species composition would favor fire-resistant species, such as Ponderosa pine, Western Larch and mature Douglas-fir. Fire-related tree mortality would be reduced through burning when environmental conditions such as air temperature and soil moistures would be conducive to a low to moderate intensity fire.

Reintroducing prescribed fire to previously underburned units would maintain stand conditions that allow the continued use of prescribed fire in the future to maintain ecosystem health and reduce fuel accumulations.

Prescribed burning and commercial harvest has been used in the past to create the conditions that exist today. Implementation of this project would perpetuate these conditions for another 10-15 years, thereby maintaining historic fire intervals.

Underburning in Commercial Harvest Units (UB)

Underburning consists of igniting fuels at a measured pace during predetermined burning conditions. Underburning may be referred to as “jackpot burning” when fuels are distributed in patches and the patches are lit individually. The goals of underburning are to reintroduce fire into the ecosystem, reduce surface fuel loading created from tree removal activities, prepare seed beds for natural and planted regeneration, reduce natural fuel loadings and continuity, and / or improve wildlife habitat and browse conditions.

When the main objective of underburning is to reduce surface fuels, a low intensity fire would be prescribed that limits mortality of overstory trees across the landscape to approximately 10%. Mortality caused by prescribed fire would typically occur in “clumps” or “patches” with differing degrees of severity (Finney et al, 2005). Historically a moderate severity patch may be up to 15 acres with mortality between 25 to 70%, with high severity patches less than 2 acres in size with mortality exceeding 70%. Underburning would favor fire-tolerant species (such as Ponderosa pine and Western larch) over fire intolerant species. This is considering that sudden wind gusts, aspect changes, and slight differences in surface fuel loadings and arrangement across a unit affect fire intensity and severity.

Underburning as Landscape Natural Fuels Reduction (UB)

Landscape Natural Fuels Reduction units are areas where underburning is the only fuel treatment proposed for a unit. Though LNF underburn units may be ignited separately from other units, many are adjacent to units proposed for underburning as a follow up to canopy or ladder fuel treatments. Including LFR areas allows for greater continuity and opportunity of reintroducing fire in a larger landscape block, as opposed to several smaller and fragmented units. Furthermore, burning larger landscape blocks decreases the need for fire line construction as there is a greater opportunity to use roads and natural features as fire breaks. Depending on weather and logistical hurdles some of the LNF units may not be completed.

Mechanical (MPB) and Hand (HPB) Piling and Burning of Fuels

Piling of fuels is a method of gathering limbs, tops, and whips (slash) from ladder fuel and canopy fuel treatments, and existing woody debris (natural fuels) for disposal. The piles are burned under safe conditions when fire is unlikely to spread; generally in the fall after conditions change to a damp weather pattern. Fuel piling may be done either with a machine, or by hand and are ignited by hand. In most cases, fuel piling occurs when terrain, access, or economics restrict the opportunity of fuel removal for biomass utilization and underburning is not feasible. A certain amount of large logs and other woody debris are retained on site to meet wildlife habitat and soil nutrient requirements.

Mechanical Piling: Also called grapple piling, it is done by a machine that can pick up debris and place it on a heap. When piles are spaced throughout the treatment unit, they would not exceed 10 feet in diameter. If the piles are at designated landings, they can be much larger. To protect the soil, grapple piling would not be done by a bulldozer pushing debris into a pile (dozer piling). The need for mechanical piling will be based on a post-harvest exam of fuel loadings conducted by the fuels specialist or their designee.

Hand Piling: Fuels are hand piled where prescribed fire or machine piling is not feasible due to slope steepness, resource concerns, or lack of access. Piles would not exceed 10 feet in diameter and would be spaced throughout the treatment units. Some piles would be left unburned for wildlife habitat.

Fireline construction

A fireline is a break in the fuel bed which prevents the spread of fire. A sufficient width may range from a few inches dug with a hand tool to a dozer line many feet wide, depending on the fuel depth or arrangement, and

anticipated fire behavior. Where needed, fireline may be used around underburn units including next to private land. The kind of fireline used depends on slope, access, and anticipated fire behavior. Hose lays may also be used to reinforce fireline in areas where an escaped fire would have a high risk of causing damage to resources and property. Though natural fuel breaks (like rocky areas and creeks) and roads would be used wherever possible to contain prescribed fire.

Hand Fireline Construction

On steeper ground and sensitive soils, crews would construct fireline by hand. This type of control line is typically used in areas with light natural fuels and poor road access. Hand fireline is generally 18-24 inches wide and down to mineral soil. A fuel break would be constructed with hand fireline consisting of cutting and dispersing surface fuels including brush, non-merchantable trees, and limbing of larger trees. The fuel break would be 15 feet wide straddling the fireline with 10 feet of clearing inside the burn unit and 5 feet outside the burn unit.

Machine Fireline

This type of control line uses a small dozer with a six-way blade so that the blade can be angled to minimize the size of the fireline. The object is not to create a scarring “catline”, but a minimal cut to expose mineral soil to a width of 18 to 36 inches, and a depth only sufficient to expose mineral soil. This method would not be employed on slopes greater than 35 percent or in RMA. A fuel break would be constructed as needed by hand consisting of cutting and dispersing surface fuels including brush, non-merchantable trees, and limbing of larger trees. The fuel break would be 15 feet wide straddling the fireline, with 10 feet of clearing inside the burn unit and 5 feet outside the burn unit.

Sanpoil Project

- Major Road
- County Road
- FS Road
- Bureau of Land Management
- Bureau of Indian Affairs
- Other Land, Including Private
- Service
- Project Boundary
- Inventoried Roadless Area
- Treatments
 - Underburn
 - Shaded Fuel Break

Scale: 0 0.5 1 2 Miles

North Arrow

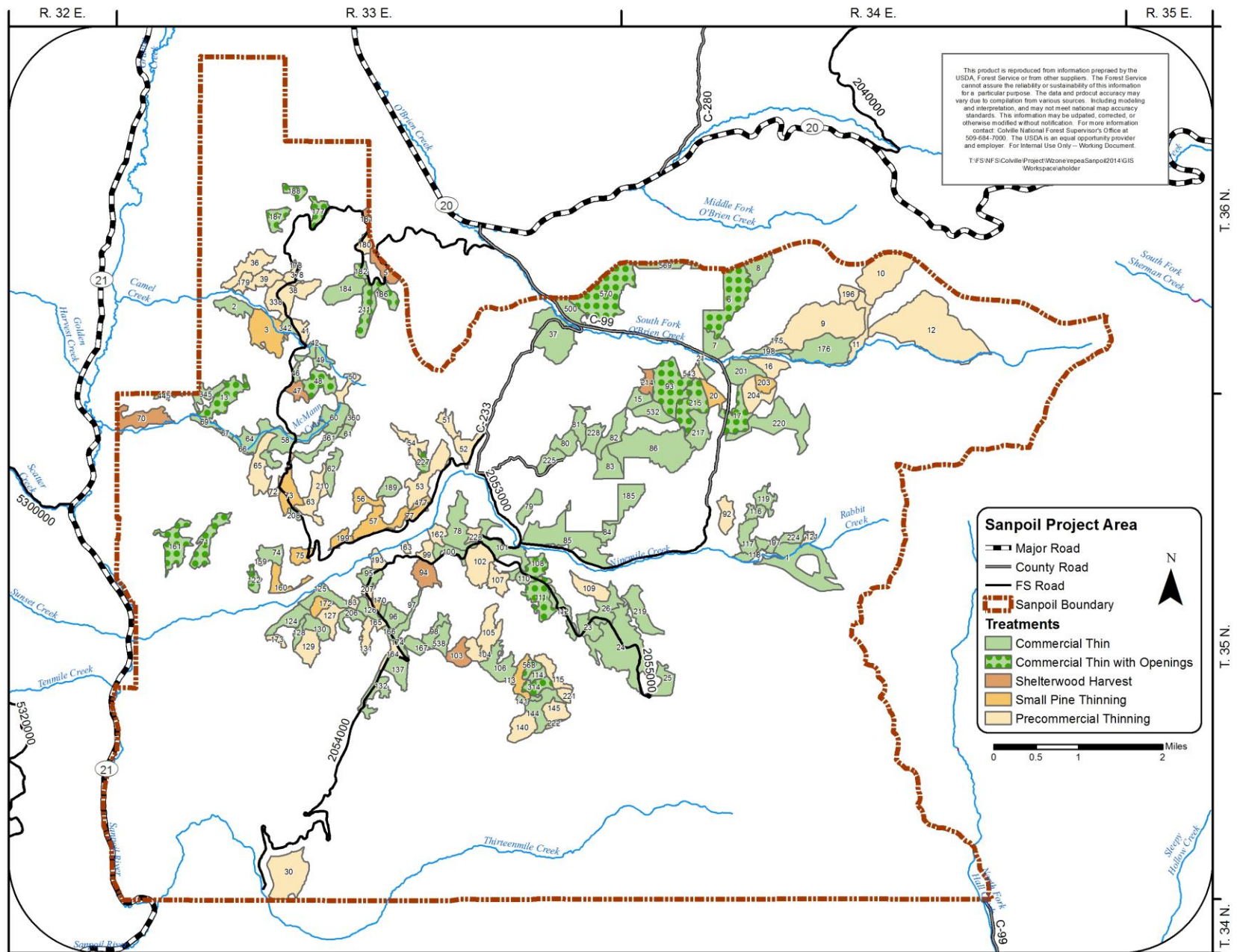
Grid: R. 32 E., R. 33 E., R. 34 E., R. 35 E.; T. 34 N., T. 35 N., T. 36 N.

Locations: Cougar Mountain, Thirteenmile, Bald Snow, Profanity

Highways: 21, 20, C-99, C-233

Coordinates: 5300000, 5320000, 2055000, 2054000, 2050600

Figure 6. Silvicultural Treatments



2.3 Transportation

A meeting of the IDT was held in April of 2017 to evaluate the transportation system in the Sanpoil project area and determine the need for modifications to the system in order to support this project as well as future management activities. The team used the forest wide transportation analysis as a baseline for desired and existing maintenance levels of all system roads. Resource specialists weighed in with high, medium, or low need for access for timber, range, and wildfire management. Specialists also provided information on the potential for risks to resources such as aquatics and wildlife. These overall ratings were tallied and a subset of roads that showed low benefit (timber, range, and fire management) and high risk (aquatics, wildlife) were discussed as possibilities for decommissioning or other changes to the maintenance level. A subset of roads that showed low benefit (timber, range, and fire management), and low risk (aquatics, wildlife), were discussed as possibilities for closure. This analysis and the discussion from the IDT were used by the line officer to determine which roads were appropriate for closure, decommissioning, and which roads would receive mitigation for any issues and be maintained.

2.3.1 Pre-haul maintenance and road reconstruction

Maintenance and reconstruction needs vary by road, but include work such as brushing, clearing and grubbing, reconditioning of roadways and ditches, replacing culverts, hazard tree management, surfacing, and cut and fill slope repairs. Road work would help provide for user and public safety and meet LMP objectives. If there were roads that are no longer needed for fire suppression, recreation use or timber management in the project area, these roads were considered for closure or decommissioning.

2.3.2 Temporary Road Work

Temporary road work would occur to facilitate harvest. In alternative 2, approximately 12 miles of temporary roads would be constructed. Temporary roads are roads used to access the interior areas of timber sale units to extract timber more efficiently and reduce ground based impacts from skidding long distances. Temporary roads are built to low specification and are obliterated at the end of the timber sale activity. Where possible, subsequent entries are designed to utilize previous roadbeds. By re-using roadbeds, soil disturbance can be reduced and existing access points revisited. These roads are not part of a permanent road system. They are not maintained or tracked. Previous roadbeds were located mainly from field reconnaissance and from historic aerial photos and remote sensing with LIDAR that showed previous logging entries. Delineating these roadbeds also helps the sale administration team locate skid roads efficiently.

Table 4. Temporary Road Work by Alternative

Alternative	Temporary Road Reopening (miles)	New Temporary Road Construction (miles)	Total Temporary Roads (miles)
1	0	0	0
2	8	4	12

Figure 8. Estimate of Temporary Roads Needed for Harvest

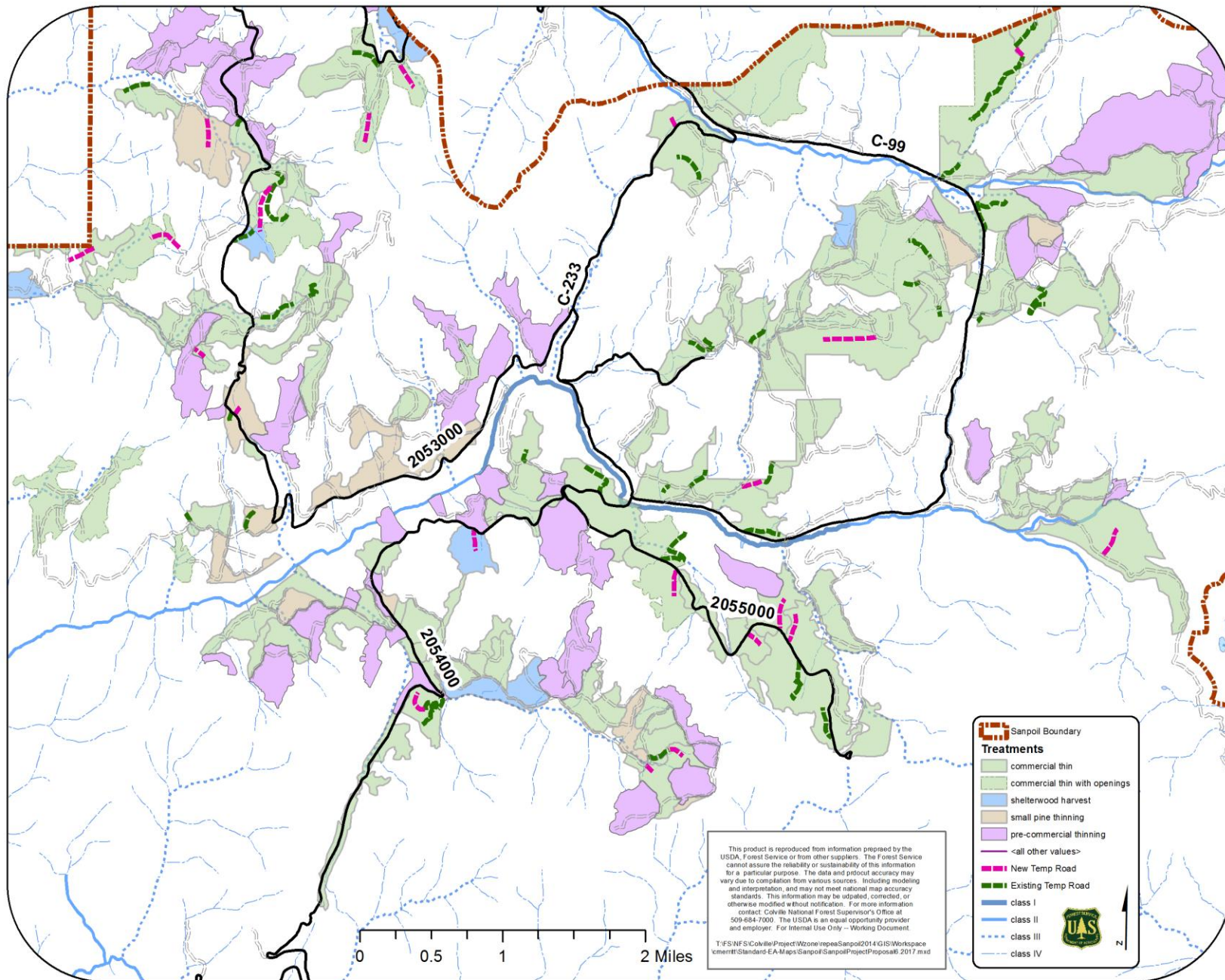
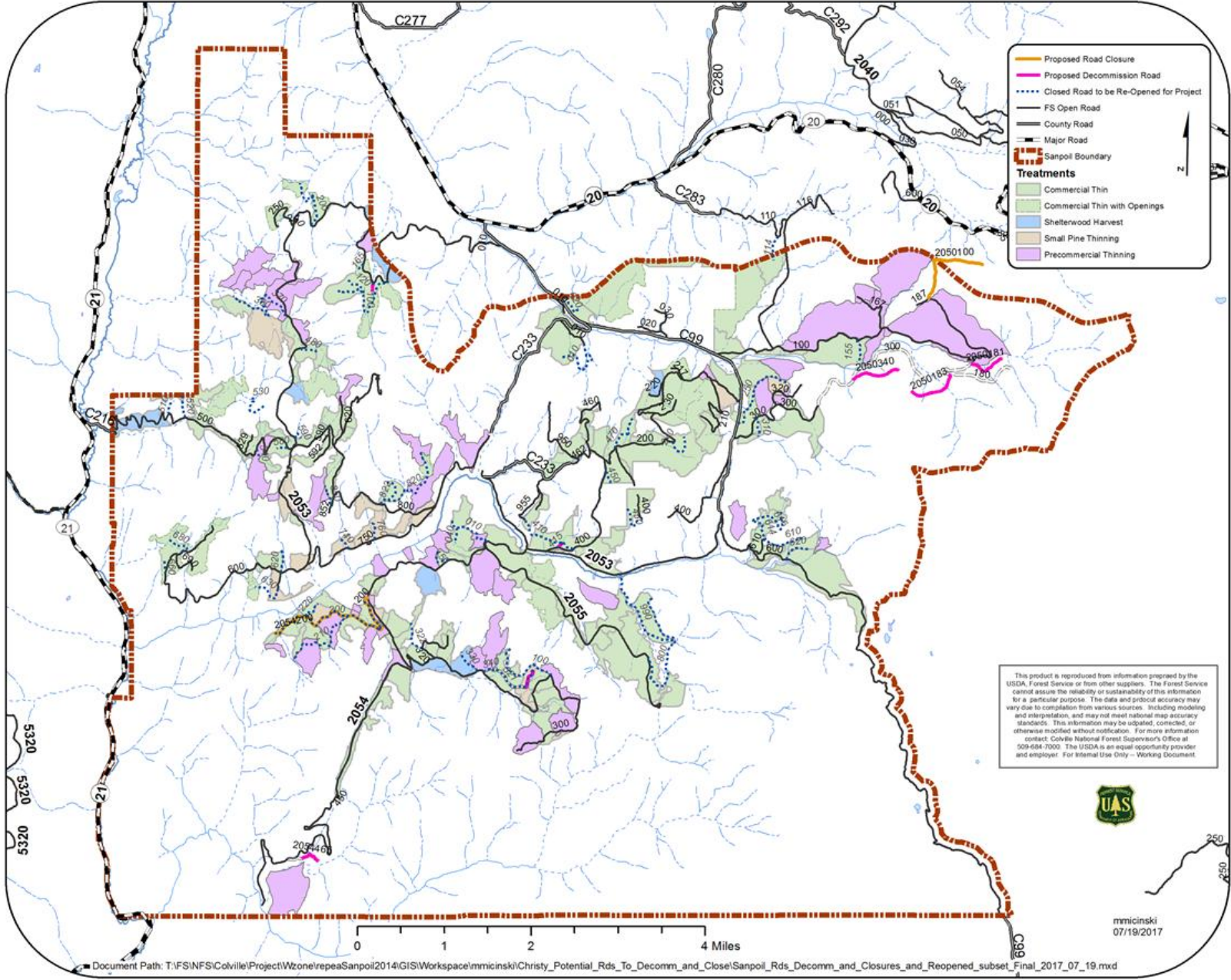


Figure 9. Planned Road Closures, Decommissioning, and Closed Roads to be used for Harvest



2.3.3 Additional Road Information

Where needed, roads within the project area would be maintained to appropriate standards to provide safe and efficient haul of timber. In addition, upgrades to live water crossings will be accomplished so crossings will pass the 100-year flows plus debris. The culverts located on Forest Service Road 2054000 – MP 0.05 at Ninemile Creek and Forest Service Road 2054200 – MP 0.44 at South Fork Ninemile Creek would be replaced to promote aquatic organism passage. These culverts will be completed under a CE during the summer of 2020 due to concerns with timing for culvert upgrades and project implementation. See the Sanpoil DN for more information regarding these culverts.

New Construction: There would be approximately a quarter mile of new road construction to replace access due to the proposed decommissioning and rerouting of road 2050290. The proposed road would start at the junction of 2050470 and 2050473 and head east running parallel and north of the existing 2050290 upslope of the existing floodplain of the creek.

Road Decommissioning: The IDT completed a travel analysis for all NFS roads in the project area. The proposed action would decommission approximately 2.6 miles of NFS roads in the project area that are generally linked to riparian or hydrologic resource damage and have been deemed unnecessary for future activities. Approximately 1.2 miles of decommissioning involves the conversion of closed roads to non-motorized trail. Approximately 0.4 miles of decommissioning will involve rerouting of the 2050290 road to prevent the road from capturing the stream.

Table 5 and Figure 9 display the roads that would be decommissioned. The method of decommissioning is dependent on the site-specific resource needs and will be coordinated between the resource specialists and the design engineers.

Table 5. Road Decommissioning Mileage and Status

Road Number	Current Status	Begin Decom. Milepost	End Decom. Milepost	Decom. Length in Miles
2050181	Closed	0	0.45	0.45
2050183 (see Conversion to Trail)	Closed	0	0.61	0.61
2050290 (see Note for Reroute)	Closed/0.03mi. Open	0	0.39	0.39
2050340 (see Conversion to Trail)	Closed	0	0.58	0.58
2050415	Closed	0	0.08	0.08
2053160	Closed	0	0.11	0.11
2054321	Closed	0.50	0.70 (0.61infra)	0.20
2054465	Closed	0.18	0.38	0.20
Total miles				2.62

Roads would be decommissioned by reestablishing vegetation and initiating restoration of ecological processes interrupted or adversely impacted by the road. Decommissioning includes applying various treatments that are designed to reconnect surface and groundwater hydrology. Examples of methods that may be used include:

- Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
- Blocking the entrance to a road or installing water bars;
- Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and

scattering slash on the roadbed;

- Completely eliminating the roadbed by restoring natural contours and slopes; or
- Other methods designed to mitigate the specific resource concerns associated with the road.

Note for Reroute: The current road prism of NFS road 2050290 would be decommissioned and removed from the National Forest transportation system. A new road would be constructed from the 2050473 to separate the road from the stream channel.

Road Closure: The Snow Peak Road 2050100 will be closed from milepost 4.80 just beyond the Snow Peak Trailhead parking area to the end of the road at approximate milepost 5.76. A gate would be installed to close off approximately 1.0 miles of road to public vehicular access but retain emergency fire access.

Conversion of Roads to Trail: A new trail called Nick's Loop would begin on the closed road 2050300 at the 2050300 junction with the 2050330, north to the junction with the 2050340, and continuing along the 2050340 which would be decommissioned and converted to trail. New construction would connect the trail to the 2050183 which would be converted to a trail open to all non-motorized uses and tie in to the 2050180 which would remain a closed road.

Temporary Road Construction and Use of Non-system Roads: Commercial harvest under the proposed action would require an estimated 12 miles of temporary road construction and use of non-system roads to provide access to proposed units. Activities would include reconstruction on existing roadbeds, new temporary road construction, and restoration of existing non-system roads.

Use of Existing Non-system Roadbeds: About 8 miles of existing non-system roads would be used during the project. Rutting would be minimized with addition of the rock surface and with the running surface maintained. Upon completion of vegetation and fuels treatments, these roads will be hydrologically stabilized.

New Temporary Road Construction: About 4 miles of new temporary road would be constructed where no roadbed exists, requiring new excavation and embankment, surfacing, and installation of drainage structures. Newly constructed temporary roads would be hydrologically stabilized at the completion of vegetation and fuels treatments.

Restoration of Existing Non-System Roads: The project area includes over 67 miles of existing non-system road templates. These templates include old roads, jeep trails, skid trails. They were delineated using digital elevation models using ArcMap. They have not been validated by field surveys. In many cases these old templates may be overgrown and stable, where active restoration would not be a benefit. The non-system roads that are reasonably accessible and that have resource concerns would be restored through full obliteration or hydrologic stabilization. The remaining non-system roads would be allowed to continue to recover naturally.

2.4 Design Elements in the Proposed Action

The design elements listed in Table 6 are specific to this project. Standard practices would also apply to project implementation (See Appendix B).

Table 6. Sanpoil design elements

No	Sanpoil Design Element	Units
Aquatics		
1	The following units border sections of water that have exceeded state temperature standards more than one year. Treatment within 150ft of streams in these RMA would be aimed at increasing stream shading over the next twenty years. Work towards historic reference conditions which may	O'Brien: 7, 21, 37, 201, 531, 532

	include re-establishing riparian hardwoods.	Ninemile: 85, 101, 125, 162, 163, 193
2	For the 2050-473 south of the 2050-470 junction and the 2050-290 road before it turns N away from the stream in section 6, the logging operations would only reuse these roads over 1 dry season or over snow and hydrologically stabilize the roads before the next spring flows to prevent capturing or worsening capture of the stream.	Units 82 and 86
3	Units entering the RMA of reaches of stream that are low on large wood without equipment access to the streams would retain all trees over 20" DBH within the RMA to retain potential to recruit large wood into the stream. The intent is to retain trees that are at least 12" diameter 35' from the large end.	Units 84, 124, 125, 197
4	Units entering RMA to within 50 feet of the stream reach which is low on large wood which have trees qualifying as large wood would include wood enhancement of the stream in the prescription and project design. The design would include delivering at least 40 trees per mile of stream in or adjacent to the unit. Trees would be at least 12" diameter 35' from the large end to the bankfull dimensions of the stream (generally 20" dbh or larger). The intent is to help correct a large wood shortage in upper Ninemile Creek.	Units 1 and 118
Botany/Invasive Plants		
5	Revegetate where soil is disturbed by harvest, fuel disposal, or road activities (typically including tractor skid trails, cut-to-length trails, landings, temporary roads, road decommissioning and road cut and fill slopes). Utilize only approved noxious weed-free seed for revegetation efforts. Locally collected native plant materials are the first choice in re-vegetation, but non-native, non-invasive plant species may also be used (USDA Forest Service 2008). Should availability be an issue with the recommended seed mix, an alternative mix can be agreed upon following consultation with the botanist.	
Heritage		
6	Fuels projects involving ladder fuels reduction and lop and scatter of small diameter trees, 6 inches or less, is allowed within site boundaries provided no heavy machinery is used within the flagged boundary of the site. Piles made for later burning must be placed outside of the flagged site boundary. If any portion of a site is visible from a system road screening vegetation should be left to conceal the site from the road.	
7	During controlled burning of units, fire is not allowed into flagged site boundaries. Additional steps will be taken to protect historic sites containing wooden features such as cabins. While unlikely to be used in the context of a controlled burn, the use of retardant on structures and artifacts is not allowed because of the salt and iron content in retardant can stain wood and other materials and cause degradation of metal objects. Digging a standard fire line around the flagged boundaries of sites is the preferred method of protection but the pretreatment of structures with foal or water is allowed, as they will not cause degradation of features or artifacts. Wrapping structures in heat attenuating materials may also be used, as it is not harmful to the structure. The final method of protection of archeological sites is left to the discretion of fire personnel to fit the unique conditions of each location provided that the protection is adequate.	
Range		
8	All rangeland improvement projects, such as developed springs, water troughs and fences not previously identified by the NEPA inventory and analysis would be delineated during layout and protected during harvest and burning activities. If identified range improvement projects become damaged as a result of the proposed action, contract provisions would provide for needed repairs.	
9	Contract provisions would require all gates located in fences and next to cattle guards within the project area be left in the condition with which they are found or immediately closed if needing to be opened.	
10	Log landings should be placed on an area other than a grass/forage meadow to avoid project conflicts with livestock management and utilization of forage by livestock.	
Recreation		
11	For the Pacific Northwest National Scenic Trail Corridor, a "passing through treatment units" sign will need to be posted on both ends of active units along forest system roads 2050600 and at access points to the PNT throughout the project area to warn through hikers of potential safety hazards	1, 117, 118, 197, 541, 557, and 560

	during project implementation. This applies to all treatment types. The purpose for this design feature is to protect recreationists from potential injury or harm.	
12	Meet the High Scenic Integrity Objective (SIO) in the immediate foreground distance zone (up to 300 feet of Barnaby Buttes TH, Bear Pot TH, Cougar TH, Edds Mountain TH, Gibraltar TH, Hall Creek Sno-Park, Ninemile Falls TH, Thirteen Mile TH, and Snow Peak TH. Marking of trees within the immediate foreground areas of the listed recreation sites will not be visible from the developed sites. This may include different methods for marking or not marking trees or blacking out marked trees as needed. Management actions adjacent to these recreation sites will not occur between July 1st and Labor Day. Use of trailheads as landings will need to be cleared through the District Recreation Specialist. After a unit has been accepted, all evidence (i.e. tags, flagging, etc.) of the management action visible for 100 feet from occupied areas of the recreation sites will be removed. Project created hazards (i.e. partially burnt snags, damaged trees) within two tree lengths of a recreation site will be felled immediately.	7, 12, 21, 24, 25, 85, 101, 148, 150, 220, 531, 537, 550, 551, 552, 554, 557, 561, and 567
13	Trails (Edds Mountain #3, Nick's Loop #3.1, Barnaby Buttes #7, Snow Peak #10, Bear Pot #19, Thirteen Mile #23, Nine Mile Falls #44, and Gibraltar Trail #46) passing through treatment units will need to be signed on both ends of active units to warn recreationists of potential safety hazards during project implementation. Project created hazards (i.e. partially burnt snags, damaged trees) within a tree length of a system trail will be felled immediately. Single track trails will not be used to skid material. Damage caused by felling, burning, or skidding operations to listed trails will be corrected immediately upon completion of a unit. Signing will be coordinated through the District Recreation Specialist. The High SIO in the immediate foreground distance zone (up to 300 feet) will be met along all trail routes. This applies to all treatment types.	2, 3, 12, 36, 40, 42, 48, 50, 60, 150, 179, 184, 188, 220, 229, 529, 537, 545, 546, 550, 551, 552, 554, 557, and 561
14	Ensure burn plans for units within the Cougar Mountain, Thirteen Mile, and Bald-Snow IRA use control methods that result in no road construction.	1, 11, 12, 24, 25, 30, 106, 121, 124, 131, 136, 137, 138, 140, 148, 160, 164, 166, 176, 546, 547, 548, 549, 550, 552, 554, 555, 556, 557, 558, and 561
15 WL	If winter harvest or haul operations are required for resource protection along CR 99 or FRs 2053 or 2050100, access will be limited to a single winter season. In addition, only one groomed snowmobile route should be closed to recreational use at a time to ensure winter recreation opportunities are available within the planning area during project implementation. If winter logging conditions deteriorate prior to all units being completed, additional winter seasons could be authorized if approved in advance by the District Ranger.	5, 7, 9, 11, 12, 17, 21, 38, 41, 42, 46, 47, 52, 53, 57, 58, 72, 73, 75, 77, 85, 90, 175, 176, 177, 178, 180, 181, 182, 186, 191, 198, 199, 201, 208, 211, 229, 230, 338, 342, 378, 429, 500, 529, 531, 536, 537, 540, 541, 542, 550, 551, 559, 560, 562, and 565
16 WL	If winter harvest or haul operations are requested by the purchaser, plow routes and operating windows will be discussed with the District Recreation Specialist and District Ranger prior to approving the request. Only one groomed snowmobile route should be closed to recreational use at a time to ensure winter recreation opportunities are available within the planning area during project implementation. This applies to all treatment types.	
17	No harvesting, hauling of timber, or moving equipment would occur on the following holiday weekends: Memorial Day, Fourth of July, and Labor Day. The Fourth of July holiday includes, at a minimum, July 3rd through July 5th. This applies to all treatment types.	

18	Valued dispersed recreation sites identified and mapped (using GPS coordinates) by the District Recreation Specialist should be treated to enhance the long-term health and sustainability of the vegetation (overstory as well as understory) within the immediate foreground zone (0-300 feet) of each dispersed recreation site so that shade, screening and dust control are provided while also meeting the scenic integrity objective associated with each dispersed recreation site.	
19	Minimize post-harvest slash accumulation within high value dispersed campsites. After harvest and fuel treatments are complete, perform basic cleanup to any high value dispersed campsites located within the harvest units. Basic cleanup means restore the access route to the general pre-project conditions, restore the integrity of the fire ring, and remove slash from the core (fire ring, parking area, and tent area) of the campsite.	
20	If a timber sale operator or other contractor wants to use a dispersed campsite for any purpose, including equipment staging, as a landing, or camping during project implementation, the District Recreation Specialist will be consulted and approve the proposed site(s) prior to selection. A camping permit and/or timber sale agreement will spell out the conditions for the commercial use of a dispersed campsite and needed restoration activities.	
Soils		
21 WL	For ground based units with 10% detrimental soil conditions or greater, practices would be included for some units to ensure that cumulative detrimental soil conditions would remain at or below 20%. <ul style="list-style-type: none">○ Conduct timber harvest when soil is covered by 8 inches of compacted snow or 8 inches of frozen soil or a combination of two that totals 8 inches. This condition should be present on approximately 90% of the timber harvest unit or○ Conduct timber harvest using cut to length logging systems where stand density supports covering forwarder trails with 8 inches of compacted slash or○ Reuse any existing skid trails, landings, and road templates.	2, 42, 56, 73, 118, and 202
22 WL	Required winter conditions shall have skid trails buffered by at least 8 inches of compacted snow or frozen ground or a combination of the two that exceeds 8 inches. If cut to length equipment is to be used, a combination of compacted slash, compacted snow, and/or frozen ground that exceed 8 inches can be used to buffer forwarder trails. The desired outcome is to limit detrimental compaction and rutting to preserve soil productivity and soil quality.	
23	Decompact landings and temporary roads to restore hydrologic function. Temporary roads should be re-contoured for their entire length. The desired outcome is to restore infiltration, provide soil cover, and stabilize soils to prevent erosion and loss of soil productivity.	
24	In units that have had commercial harvest, keep follow up fuel treatment machinery to designated skid trails except for limited passes off designated skid trails. Fuel reduction machinery (i.e., masticators and piling equipment) should be tracked equipment having a ground pressure rating of 8 psi or less and with an articulating arm capable of reaching at least 20 feet. The desired outcome to prevent detrimental soil conditions and prevent harvest/fuel treatment units from exceeding 20% detrimental soil conditions per SQS.	
25	Skid trail spacing shall be specified in the timber sale/stewardship contract as follows (FW-DC-SOIL-01/02). <ul style="list-style-type: none">○ Skid Trail Spacing: 100 feet apart edge to edge, except when converging at landings or avoiding obstacles – feller-bunchers are allowed limited passes off trail○ Forwarder Trails: 50 feet apart edge to edge except when converging at landings or avoiding obstacles. Four to eight inches of compacted slash should cover forwarder trails – harvesters are allowed limited passes off trail○ Tethered Assisted Steep Slope Machine Cutting/Bunching: 40 to 50 feet apart edge to edge (depending on the capability of the machine), except when converging at landings or avoiding obstacles.	
26	Skidding equipment shall travel on designated trails. When feasible re-use old skid trails. Feller-bunchers and forwarders should concentrate use on skid trails/forwarder trails and should travel in an efficient manner with limited passes off trails. The desired outcome is to limit detrimental soil conditions to preserve soil productivity and comply with SQS and LMP.	
27	Slope limitations for ground based equipment as follows. The desired outcome is to limit detrimental soil conditions to preserve soil productivity and reduce erosion potential. (FW-DC-SOIL-01/02 and FW-STD-SOIL-01) <ul style="list-style-type: none">○ Rubber tired skidders should be limited to slopes less than 35%. Short slope lengths may be steeper, at the discretion of sale administrators. Adverse skidding with rubber tired skidders is limited to slopes less than 20%.○ Feller bunchers, harvester-forwarder systems, and other tracked heavy equipment should be limited to slopes less than 45%. Short slope lengths may be steeper.○ Tethered assisted steep slope machines (SSM) should be limited to slopes less than 70%. SSM should be	

	tethered on slopes greater than 45% and use adequate cable tension. Tethered equipment shall remain on the designated trails. SSM equipment and practices should conform to Washington State Department of Labor and Industries Technical Report Number 98-02-2019. Treatment units where SSMs will be used for implementation should be evaluated for geologic instability. At this time there shall be no tethering of rubber tired skidders due to the lack of soil disturbance monitoring information for that logging system.	
28	Minimize compaction, rutting, and erosion by avoiding activities during wet conditions. Ground based equipment would operate on relatively dry soils of high soil strength or bearing capacity. Rutting exceeding soil quality standards should be remediated. The Field Guide to Soil Moisture Conditions Relative to Operability of Logging Equipment (Rust, 2005) should be used to determine soil trafficability. The desired outcome is to limit detrimental soil conditions and comply SQS and LMP.	
29	Target machine pile size to 15 feet in diameter and 10 feet in height outside of landings. (FW-DC-SOIL-1 and FW-STD-SOIL-01) The desired outcome is to maintain sufficient amounts of organic matter and to avoid detrimental physical and biological soil conditions. Smaller piles allow for re-colonization by soil organisms and prevent excess tracking from mechanical equipment when creating piles.	
Wildlife		
30 WL	Winter Range Seclusion- In designated winter range habitat, activities should be restricted December 1 to March 31 st . When winter logging activities occur, project related activities should be done in the blocks recommended to reduce movement of ungulates during these resource limited months. Recommended blocks may be broken down further as appropriate for on the ground actions.	Recommended Unit Blocks: 30, 132, 136, 148, 150, 546, 547, 552, 554, 555 561; 95, 96, 97, 98, 126, 138, 158, 164, 165, 166, 167, 169, 170, 171, 174, 193, 207, 538; 74, 159, 160; 71, 161; 53, 54, 55, 56, 57, 60, 61, 62, 63, 73, 75, 77, 189, 199, 208, 227, 360, 361, 477, 530, 533, 540, 562, 563, 565, 566; 2, 13, 27, 44, 58, 64, 69, 70, 192, 229, 230, 345, 429, 445, 535, 544, 545, 549; 36, 39, 178, 179, 537, 545, 551; 90, 550, 560

31	<p>Hiding Cover – Within ungulate winter range, where the opportunity exists, retain clumps or patches of shrubs and trees to provide hiding cover (minimize sight distance) along open roads adjacent to regeneration harvest units. The intent is to limit disturbance to wildlife from motorized vehicles, decrease vulnerability to shooting, and discourage OHV travel off-roads. To the extent feasible, maintain the hiding cover value of these vegetative clumps and patches during post-harvest site preparation and fuels treatments. Hiding cover is defined as vegetation or topography that is capable of hiding 90% of an elk at a distance of 200 feet.</p>	5, 47, 70, 94, 103, 138
32	<p>Goshawk Nesting Habitat- No timber harvest, prescribed burning, or other project activities will occur within active (reproduction attempted within the last five years) 30 acre nest stands.</p> <p>Within the mapped five alternate nest stands (total of 150 acres), ensure more than 50 percent canopy closure is retained post-harvest. Alternate nest stands occur in the vicinity of active nest stands based upon suitable habitat, they do not necessarily occur in the same unit as the active nest.</p>	<p>Active nests occur in the following units and outside of the proposed project units:</p> <p>Quartz Mtn. Territory: 3, 42, 342</p> <p>McMann Creek Territory: 445, 549</p> <p>13 Mile Sanpoil Territory: 546, 552, 561</p> <p>Bear Mt. Territory: 138, 174, 556</p> <p>Bearpot Territory: 24, 25</p> <p>Nine Mile Falls Territory: 101, 550</p> <p>Sanpoil 600 Rd. Territory: 1</p> <p>Rabbit Rd. Territory: 21</p> <p>Alternate nest stands occur in the following units and outside of proposed units:</p> <p>Quartz Mtn. Territory: 2, 3, 40, 41, 42, 48, 49, 342</p> <p>McMann Creek Territory: 70, 549</p> <p>13 Mile Sanpoil Territory: 546, 561</p> <p>Bear Mt. Territory: 138</p> <p>Bearpot Territory: 24, 25, 219</p>

		<p>Nine Mile Falls Territory: 101, 108, 110, 550</p> <p>Sanpoil 600 Rd. Territory: 1</p> <p>Rabbit Rd. Territory: 7, 20, 201, 531</p>
33	<p>Goshawk Post-fledging Areas (420 acres total) - Timing restrictions on all project related activities (including layout) from March 1st through August 31st. If nest monitoring shows that the territory is inactive the timing restriction may be waived by the wildlife biologist.</p>	<p>The PFA timing restriction occurs in the following units and outside of proposed units:</p> <p>Quartz Mtn. Territory: 2, 3, 36, 39, 40, 41, 42, 48, 49, 179, 338, 342, 534, 545</p> <p>McMann Creek Territory: 44, 69, 70, 345, 445, 549</p> <p>13 Mile Sanpoil Territory: 30, 546, 552, 561</p> <p>Bear Mt. Territory: 98, 103, 106, 137, 164, 167, 174, 538</p> <p>Bearpot Territory: 24, 25, 219</p> <p>Nine Mile Falls Territory: 101, 102, 107, 108, 110, 111, 223, 550</p> <p>Sanpoil 600 Rd. Territory: 1, 121, 197, 224</p> <p>Rabbit Rd. Territory: 7, 17, 20, 21, 93, 201, 202, 215, 217, 531, 541, 542, 543, 567</p>
34	<p>Lynx Analysis Units (LAUs) - Within LAUs retain a minimum of 20% in untreated patches and do not reduce tree stem densities to less than 500 trees per acre in early structure subalpine fir/lodgepole pine or spruce/subalpine fir vegetation types.</p>	<p>Units within the West Sherman LAU- 11, patches/portions of units 1, 9, 12 and 175 where</p>

		vegetation type and structure is as described.
35	Lynx Habitat Components – Project activities shall not reduce horizontal cover (snowshoe hare habitat) in late-closed structure subalpine fir/lodgepole or spruce/subalpine fir vegetation types unless current conditions exceed historical range of variability (HRV) for late-closed structure.	Units within West Sherman LAU: 1, 220, 558

*WL identifies winter logging requirements.

3.0 Environmental Consequences

This section summarizes the physical, biological, and social environments of the affected project area and the potential changes to those environments due to implementation of the proposed action. The potential effects of the proposed action are evaluated within the context of relevant past, present, and reasonably foreseeable future actions in appendix A. The potential effects of these actions in combination with the potential effects of the proposed action are referred to as "cumulative effects," which are integrated into the analyses below. In preparing the analyses, the IDT reviewed and considered the most relevant and current scientific data available. Section 3.5 describes the consistency of the proposed action with laws and requirements imposed for environmental protection.

Complete reports are incorporated by reference and available in the project file at the Three Rivers Ranger District, Kettle Falls, Washington or at:

<https://www.fs.usda.gov/projects/colville/landmanagement/projects>

3.1 Forest Vegetation

The no action alternative would not reduce tree stocking or improve individual tree vigor and resistance to insect and disease attack. Forests with low and mixed-severity disturbance regimes would remain susceptible to uncharacteristically high-severity disturbances. There would be no precommercial nor commercial thinning to release stands for quickly achieving late structure. Aspen stands and open meadows in the project area would continue to experience conifer encroachment and diminish in size and/or vigor. No additional economic employment associated with service or timber sale contracts would be created under this alternative

Unit treatments and locations for the proposed action alternative were designed to meet the purpose and need of the project and to be consistent with the LMP. Treatments would aim to increase stand vigor and growth and reduce the potential for undesirable wildfire effects and insect and disease attacks and move toward desired distributions of structural classes by treating stands primarily in the Douglas-fir dry and subalpine fir / lodgepole pine forest vegetation types (see Table. 7) Treatments would be designed and implemented to reduce stand density, canopy layering, and the preponderance of Douglas-fir and subalpine fir, all of which would generally reduce conditions favorable to forest insects, promote individual tree growth and resistance to biotic (diseases and mistletoes) and abiotic (drought) stressors. Silvicultural prescriptions would be designed to move stand-level susceptibility from a "High" or "Moderate" level to a "Moderate" or "Low" level or be designed to maintain a "Low" level of susceptibility. Project activities would also reduce or minimize conifer encroachment in delineated meadows) and enhance the extent and vigor of quaking aspen through conifer felling or burning over a period of approximately 10 years. The extent to which this would occur is estimated to be on the order of 50-500 acres within the footprint of planned activities, but the exact extent or location of each meadow and aspen stand affected is uncertain.

Table 7. Resource indicators and measures for the proposed action direct and indirect effects on forest structure classes and vegetation types

Vegetation Type	Category	Structure Class				
		Early	Mid Open	Mid Closed	Late Open	Late Closed
Douglas-fir Dry 35,145 acres	Current	14	22 (a)	47 (a)	2 (b)	15
	Desired	6-16	2-8	4-13	38-78	1-32
	Post-treatment year 0	15	45 (a)	23 (a)	10 (b)	7
	Change	+1	+23	-24	+7	-8
Northern Rocky Mountain mixed conifer (NRMCM) 58 acres	Current	0	5	68	0	27
	Desired	N/A				
	Post-treatment year 0	0	12	61	0	27
	Change	0	+7	-7	0	0
Subalpine fir / Lodgepole pine 10,500 acres	Current	17 (b)	7 (a)	60 (a)	0	15 (a)
	Desired	45-65	0	33-53	0	3
	Post-treatment year 0	26 (b)	16 (a)	44	3 (a)	10 (a)
	Change	+9	+9	-16	+3	-5
Spruce / Subalpine fir 1,311 acres	Current	39	12 (a)	44	1 (a)	4 (b)
	Desired	14-46	0	13-41	0	29-57
	Post-treatment year 0	43	12 (a)	40	1 (a)	4 (b)
	Change	+5	0	-4	0	0

*Light grey shading where the proposed action moves structure class conditions away from HRV in the short-term. Medium grey shading indicates where the proposed action moves structure class conditions toward desired conditions but does not move it far enough to change it from above or below HRV. Dark shading indicates where the proposed action moves structure class to within HRV. An absence of shading indicates where the proposed action results in no change to the current structure class percentage, or condition above/below (indicated by an (a) or (b), respectively) desired ranges. All numeric values indicate percentages relative to the respective vegetation type.

The proposed action will also create jobs adding economic benefit through service contracts, roadwork, and harvest acres of timber to local and surrounding areas. For commercial harvest units, McKetta et al. (2016) found an average of 1.79 private-sector jobs created per million board-feet across the Tri-County area in northeast Washington. Assuming the Sanpoil project generates 50 million board-feet of timber volume sold over a 10-year period, that equates to approximately 90 private-sector jobs associated with the commercial forest products markets, and 10 public-sector employment opportunities. Non-commercial activities associated with the project would result in employment opportunities for approximately 20-40 private-sector workers and 5 federal workers on a seasonal (part-time) basis over a 10-year period.

The spatial boundary for analyzing cumulative effects is the planning area. The temporal boundary for cumulative effects is 10 to 30 years into the future because that is a timeframe in which changes in structure, species composition, and density are expected to remain measurable and predictable with a reasonable degree of certainty. The temporal bounding of past effects is the era when vegetation management and fire suppression began in the project vicinity—approximately 1900. Relevant past, present, and reasonably foreseeable future activities from appendix A were considered. Cumulative effects regarding fire suppression would be a partial reversal of effects associated with fire suppression activities within the Sanpoil project area. Effects from fire suppression activities that would be partially reversed include but are not limited to increasing abundance of mid and late-seral tree species, increasing vegetation density, increasing amount of canopy layering, and increased live and dead fuel loading. Cumulative effects from other past vegetation management activities within the project area or within the three watersheds would be negligible due to the spatial

distribution and mix of compensatory and additive effects of Sanpoil project activities.

The proposed action has been reviewed and is determined to comply or be consistent with the laws, regulations, policies and LMP direction as applicable to forest vegetation resources in the project planning area. The suitability of NFS lands for various uses and management activities are identified in the LMP, including planned and unplanned ignitions, forest products and timber production. There are no non-suitable uses planned as part of the Sanpoil project for any Management Area's where treatments are occurring.

3.2 Fire and Fuels

A no action alternative would continue with a management policy of fire exclusion. This would result in no improvement in stand vigor and related forest health. Afforestation, inter- and intra-stand stocking levels and crown fire potential would continue to increase. The potential for substantial air quality degradation would increase in the long-term under this alternative. Stands would move from being moderately altered from their historic range of variability Fire Regime Condition Class (FRCC 2) toward a state where they are substantially altered (FRCC 3) from their historic range of variability, where the risk of losing key ecosystem components is high and changes to fire size, frequency, intensity, severity or landscape pattern may occur. Also, fuels accumulations would continue to shift away from grass, brush and hardwoods to a condition favoring high levels of coarse woody debris, litter, duff and ladder fuels. Therefore, impacts to air quality, resiliency to wildfire, and firefighter and public safety, would worsen over time under the no action alternative.

The fire and fuels analysis is based on three indicators: air quality measured as noncompliance or degradation, resilience to wildfire measured as stands moved toward Fire Regime and Condition Class 1, and firefighter and public safety measured as acres of commercial and non-commercial fuels treatments. Table 8 summarizes the existing condition and proposed action for the three indicator measures that are related to addressing the purpose and need.

Table 8. Summary of how the proposed action addresses the purpose and need

Purpose and Need	Resource Element	Resource Indicator	Measure	Alternative 1	Alternative 2
Promote forest health and resiliency within the planning area to foster conditions that are less prone to disturbance events including insect, disease and wildfire.	Air Quality	Noncompliance or degradation	Compliance	N/A Air Quality analysis is a regulatory requirement	
	Resiliency to wildfire	Stand conditions of a healthy forest	Move stands toward FRCC 1, (acres burned)	Stand conditions will continue to move from FRCC1 and 2, towards FRCC3, away from desired conditions and towards a landscape that is less resilient to disturbance	8,666 acres underburn 7,163 acres pile burn 5,890 acres harvest. Treatments trend to FRCC 1 increasing resiliency to wildfire disturbance
	Firefighter and Public Safety	Fuels accumulation and continuity	Commercial, non-commercial and fuels acres treated	1,538 acres treated in the WUI, while treatment in the WUI may protect infrastructure, in most cases, these treatments are not along strategic roads. Therefore, WUI treatments that will occur independent of	There are 2,270 acres of shaded fuel break treatments along 36 miles of roads in the project area. By treating along strategic roads, the potential for fire suppression activities to be successful increases, thereby reducing the potential for large scale disturbance that could affect

				the Sanpoil project will not substantially reduce the susceptibility of this area to disturbance.	the forest health of the planning area.
--	--	--	--	---	---

The proposed action would reduce forest density from existing conditions. The reduced density would result in improved tree health and vigor, and a resulting increase in resilience to disturbances such as wildfire. However, within 30 years the effects of the Proposed Action would diminish such that potential fire severity class and forest density class would approach the values of the existing condition. These changes result from the growth of trees, addition of fuels, and increasing continuity of fuel.

The analysis area for the effects to fire and fuels is the project area because treatments related to fire and fuels are not contained to units. The temporal scale for cumulative effects analysis for fire and fuels in Sanpoil is 30 years. The time frames associated with direct and indirect effects to fire and fuels treatments varies across the landscape depending on vegetation type and climate. Generally speaking, fuel treatments need maintenance activities (burning, mechanical, etc.) that mimic historical fire return intervals. An example of this is low to mid elevation ponderosa pine, Douglas fir and western larch forests that typically represent the low and mixed severity fire regime with average fire return intervals of 5 to 30 yrs. The cumulative effects analysis area for air quality is the Kettle Crest west of Lake Roosevelt.

Past, present, and reasonably foreseeable future actions were reviewed including actions by the Colville Confederated Tribes of the Colville reservation, past treatments in the Republic Ranger District, and previous WUI fuels treatments in the Sanpoil area. There could be additional smoke from burning that could be conducted on Colville Confederated Tribal land. However, coordination with WA Department of Natural Resources (DNR) for smoke management would ensure compliance. Project activities effects to the indicators and measures of air quality, resilience to wildfire, and firefighter and public safety are all within compliance levels, beneficial, and/or temporary. Therefore, cumulative effects of other past, present and reasonably foreseeable future actions along with project activities would likely only improve indicators and measures.

Fire and fuels treatments would help achieve LMP direction by providing cost efficient options for fire protection including compartmentalization of large landscapes, treatment of activity fuels and consideration for public safety along important ingress-egress routes. Treatments would improve community protection and enhance public and firefighter safety (LMP 38), move stands towards desired vegetative conditions and have landscapes dominated by FRCC I (LMP 39), and assist in achieving the objectives described in the management area descriptions and plan direction (LMP 93-153).

3.3 Aquatics

The aquatics assessment focuses on proximity of proposed activities to live/surface connected waters and the potential or likelihood that project activities will impact sediment delivery, stream temperature, large woody debris recruitment, or effective stream length and passage of both organisms and stream material. The Sanpoil project is partially within the O'Brien Creek, Scatter Creek, Ninemile Creek, Thirteenmile Creek, Upper Hall Creek and Seventeenmile Creek subwatersheds, with water draining into waterways on the Colville Indian Reservation as well as private land.

Under the no action alternative most of the resource indicators would remain near present levels unless a large wildland fire occurs. Roads would likely be maintained in the same condition and may increase sediment delivery to streams between maintenance intervals. Canopy closure would likely continue to increase in riparian zones leading to increased shading that may cause decreases in stream temperature. With the forest density class increasing over time (Pfeiffer, 2020) large wood would continue to recruit into streams. The FRCC is indicative of condition class 2 in 97% of the planning area indicating that fire frequencies are moderately altered from their historical range (Corvino, 2020). With no treatment, stands would continue to move towards FRCC 3 where dramatic changes to fire behavior are likely. This increases the chance that a higher severity fire would affect streams as a higher severity fire would likely increase sedimentation and decrease canopy cover near the affected streams. Large wood recruitment in the moderately severe burn area would increase in the short term (up to 20 years) with decreased recruitment following for several decades. Large wetlands or meadow areas such as the beaver pond area on Ninemile and the meadow reach on lower O'Brien creek would have the capacity to absorb sediment so fires above these reaches would likely not cause increased sediment delivery to the Sanpoil river. However, there is a redband population in the lower reaches of O'Brien creek where increased sedimentation could affect their spawning habitat.

Proposed activities with the potential to impact aquatic resources are generally related to timber management operations and include tree falling, skidding, temporary road construction and use of temporary roads, but can also include prescribed burns, road improvements, road decommissioning and thinning proposed within some riparian areas. Effects to the indicators and measures of sediment delivery, stream temperature, large woody debris recruitment and effective stream length and passage of both organisms and stream material are minor, minimal, transient in nature, and short-term. None of these effects are likely to approach significance. The Aquatics Report contains additional information and analysis for each of these indicators.

Table 9. Direct and indirect effects of alternative 2 for the aquatics resource

Resource Element	Resource Indicator (Quantify if possible)	Measure (Quantify if possible)	Alternative 2 Direct/Indirect Effects		
Water quality	Sediment delivery	Road surface and condition in proximity to water (affecting PPM and WDR for fish)	Short term increase followed by intermediate term decrease. Levels could return to near present levels in the absence of long term maintenance schedule.		
Water quality	Stream temperature	Canopy cover changes	Small changes to outer zone canopy cover that would have minimal to no effect of stream temperature		
Riparian Function, and Channel Stability	Large woody debris recruitment	LWM and Dominant and subdominant trees	Minimal effects due to possible road reconstruction at stream crossings		
Hydrologic Function	Effective stream length and passage of both organisms and stream material	Barriers to passage	2 removed in Ninemile subwatershed		
		Road density Impaired Function (IF) Functioning at Risk (FAR) Properly Functioning (PF)	Subwatershed	All during	All After
			O'Brien	2.0 FAR	1.9 FAR
			Ninemile	3.1 IF	2.9 IF
			Scatter Creek	4.1 IF	4.1 IF
			Thirteenmile	0.96 PF	0.95 PF
			Upper Hall	0.52 PF	0.52 PF

The Sanpoil project would have no effect to any federally listed species for the Colville National Forest due to a lack of Bull trout (*Salvelinus confluentus*) or critical habitat. The Sanpoil project would also have no effect to the following USFS Sensitive species due to lack of individuals and suitable habitat: Pygmy whitefish (*Prosopium coulteri*), and Umatilla Dace (*Rhinichthys Umatilla*). There would also be no effect to Lake Chub (*Couesius plumbeus*) due to lack of individuals and barriers to migration into the area.

The Sanpoil project may impact individuals or habitat but will not likely contribute to a trend towards Federal listing or loss of viability to populations or species for Westslope cutthroat trout (*Oncorhynchus clarki lewisi*) and Interior Redband trout (*Oncorhynchus mykiss gairdneri*). The potential for impacts to these species would be due to short term-increases of sedimentation followed by intermediate to long term decreases and minimal decreases in canopy followed by a chance of increased canopy due to increased riparian vigor (with subsequent negligible chance of temperature increases followed by small temperature decreases). For other trout, changes to habitat would be the same as for the two USFS sensitive species above.

The spatial boundaries for analyzing effects to hydrology and fisheries are the Upper Hall Creek, Thirteenmile Creek, Ninemile Creek, Scatter Creek and O'Brien Creek subwatersheds because sixth field subwatersheds are small enough that effects can be seen. The temporal boundaries for analyzing effects are twenty to thirty years before and after treatment as the amount of canopy closure can impact stream temperatures and the amount of sedimentation from roads is dependent upon surface vegetation present on the road or decommissioned roadbed.

Past, present, and reasonably foreseeable actions listed in appendix A were considered including residual effects of non-system roads, past timber harvest, grazing, and the White Mountain and North Star fires. Cumulative effects for sediment are due to past timber harvest, past fires, non-system roads and ongoing grazing having the potential to add sediment to streams. When considering these cumulative effects, alternative 2 would result in small short-term increases in sediment followed by an intermediate dip in sediment from improved road maintenance and drainage. However, with current use levels the benefits from road maintenance may decrease over time to trend near present levels in twenty years, without regularly scheduled maintenance. Cumulative effects for stream temperature and large woody debris recruitment are both due to past fire and prior timber harvest. Cumulative effects for these two indicators are not expected due to timing of past activities, or spatial distribution of past and proposed activities. Cumulative effects for effective stream length and passage of both organisms and stream material would be the potential for increased impacts followed by decreases in the long term due to project obliteration or hydrologic stabilization of level 1 (closed) and non-system roads.

Alternative 2 complies with all applicable LMP Water Resources and RMA standards due to design elements that protect and enhance RMA for the long-term and replaces two crossings on perennial streams within the Ninemile subwatershed. This alternative allows harvest and underburning within RMA that could cause changes in the canopy cover within 110ft. Since the treatments in the RMA are designed to primarily remove smaller trees and leave the largest trees the changes in canopy cover are expected to be small and transient in nature. These changes could last up to five years and are offset by increased resilience to fire post-treatment. In some cases removing trees may release the remaining trees to grow faster, providing more shade over time whether or not a fire comes through the RMA. The goal of these treatments is to attain or maintain desired conditions of large trees in the RMA. This alternative also moves the area towards desired conditions and incrementally moves the subwatershed towards improving watershed condition class.

3.4 Other Resources Considered and Findings

The following sections are summarized from the resource specialist's reports, the Biological Evaluation and the Effects to Management Indicator Species for the Sanpoil project. The project file is available at the Three Rivers Ranger District, Kettle Falls, WA or at <https://www.fs.usda.gov/projects/colville/landmanagement/projects>

3.4.1 Wildlife

Under a no action alternative, habitats would continue to deviate from HRV standards which in the long term

would have negative effects to species and habitat groups. Existing late structural stage stands would continue to exist on the landscape, but without commercial thinning of mid-structural stage stands the addition of late structural stages would be slowed. Further deviation from HRV will cause viability of species to decrease further.

In the Sanpoil project area, there is presently an over-abundance of stands in middle structural stages and a deficit of stands in both the early and late structural stages, relative to historic conditions. The Wildlife analysis looked at effects to species listed as threatened or endangered under the US Endangered Species Act and those listed on the 2015 USFS sensitive species list. There are no major wildlife issues associated with the project, and comments through public scoping and the draft period have been considered. Therefore, there are no wildlife issues that would result in unresolved conflicts or changes to the proposed action.

The proposed action would move the project area closer to its historic condition with regards to the tree species mix, stocking levels, stand structural stages, and fuel loading. Thinning would reduce the risk of destructive, stand-replacing fires, adding improved potential for late structural stage stands to persist on the landscape over time. The action would also increase forest edge habitat and the percentage of stands in early structural stages; improving conditions for big game species and many sensitive invertebrates. Snowshoe hare habitat could be recruited within created openings in 15-20 years, potentially benefitting lynx. Grizzly bears and other wildlife would be better able take advantage of existing shrub and herbaceous forage resources within the area.

The project as proposed would be consistent with LMP standards and guidelines for TES and other wildlife. The project would be consistent with standards, guidelines, and recommendations in the grizzly bear recovery plan (USFWS 1993) and other guidance for grizzly bears (USDI et al. 1986, USDA 2011). The project would be consistent with management recommendations in the LCAS (Interagency Lynx Biology Team 2013). In addition, the project would adhere closely to management recommendations in existing conservation assessments and other guidance for sensitive wildlife species, as described in the Sanpoil biological evaluation for terrestrial wildlife.

Tables 10-13 summarize the effects determinations and cumulative effects for Threatened and Endangered Species, sensitive species, surrogate species, and management interest species and landbirds. There are three Management Indicator Species (MIS) that are identified in the species columns in the tables below.

Table 10. Summary of effects determinations for T&E species which occur or have habitat within the project area

T&E species	Effects Determination	Rationale for Determination	Cumulative Effects
Canada lynx	May affect, not likely to adversely affect	No known lynx den sites on the CNF. Stands with potential den sites would be protected by avoidance. Activities near these stands would occur outside of the denning time period. Timber harvest could promote growth of snowshoe hare habitat in the project area within 5-10 years. This project would be consistent with management recommendations in the Canada Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013).	Cumulative effects are evaluated within each individual LAU as directed by USDI 2001. Therefore, the cumulative effects area for this project is the West Sherman and Hall Creek LAUs. The effects from this project would be cumulative to those resulting from the White Mountain fire which occurred in 1988. The fire has created additional primary forage habitat for lynx within the West Sherman LAU. This habitat will continue to grow and create more primary prey habitat adding a beneficial cumulative effect to lynx habitat.
Grizzly bear	May affect, not likely to adversely affect	This project is outside of a designated grizzly bear recovery zone. There would be an increase in disturbance and a small reduction of core habitat during project implementation. Post-project, drivable road densities would be reduced and core habitat would be increased. Hiding cover would be degraded in the short term, hiding cover would be maintained along open roads when possible. Timber harvest and under-burning would likely improve local green forage production / palatability, and berry production over the short to mid-term.	In grizzly bear recovery areas, biologists evaluate and monitor habitat over individual bear management units (BMUs). Since the project area is not within a recovery zone, the cumulative effects area can be described as the CNF west of the Columbia River. Past, present, and reasonably foreseeable future projects considered for cumulative effects to grizzly bears include; other vegetation management projects, wildfires, and grazing. The proposed project would create a decrease in hiding cover for approximately 5 years, a decrease in seclusion habitat due to an increase in human disturbance, and a potential increase in forage habitat. These effects would be cumulative to those resulting from other similar vegetation management projects that are active or proposed. Wildfires which have recently occurred on the landscape would create an influx of forage habitat as growth of understory plants would be stimulated, creating a beneficial cumulative effect to forage. Conversely, grazing decreases the amount of forage available on the landscape. This action adds a negative cumulative effect to grizzly bear habitat.
Wolverine	Not likely to jeopardize the continued existence of wolverines, lead in a trend towards federal listing or loss of viability, or result in the destruction or adverse modification of proposed critical habitat.	The proposed action would change the structural stage distribution by moving it towards more historic conditions, conditions in which wolverines evolved. For prey habitat, the proposed action would slightly improve conditions by improving forage.	The area considered for cumulative effects analysis consists of the Kettle Range south of the Canadian border because wolverines have such large home ranges and occur at such low densities. There are cumulative effects which will occur to wolverine habitat due to the overlap of other USFS vegetation restoration projects throughout the cumulative effects area with the Sanpoil project. The resulting effects will include an additional decrease in hiding cover for approximately 5 years, a decrease in seclusion habitat due to an increase in human disturbance, and a potential increase in forage habitat. In consideration of these cumulative effects we are still meeting forest plan standards and guidelines for wolverine habitat.

Table 11. Summary of effects determinations for sensitive species which occur or have habitat within the project area

Sensitive Species	Effects Determination	Rationale for Determination	Cumulative Effects
Great gray owl (GGO)	May impact individuals but is not likely to lead in a trend towards federal listing or loss of viability	The proposed action would improve the amount of forage habitat, maintain sufficient nesting habitat, and reduce the risk of future intense wildfires in the project area primarily through timber harvest but also to a lesser extent due to fuels reduction treatment areas. The development of additional late structural stage stands forage resources for prey species would improve on treated sites for a number of years	Cumulative effects were analyzed at the forest wide scale due to the infrequency of GGO presence on the forest. Past, present, and reasonably foreseeable future projects considered for cumulative effects to GGO include other vegetation management projects (see Appendix A). Any actions which will create openings could provide foraging habitat for GGO for 10+ years following harvest. Thinning and selection harvests would cumulatively reduce the tree density in many forest stands, thus improving nesting habitat. The ability of large avian predators to fly through the harvested stand canopies would also be improved. These effects would be cumulative to those resulting from other, similar vegetation management projects that are active or proposed across the forest.
Northern goshawk (MIS Species)	May impact individuals but is not likely to lead in a trend towards federal listing or loss of viability	Move the area towards the more historic range of stand structure and size classes, conditions in which the goshawk evolved. Proposed harvest and fuels reduction treatments would reduce the risk of future, intense wildfires occurring in the project area. Harvest in the probable foraging area of three out of the seven territories could reduce habitat quality to where the birds might abandon the territory. As nest and PFA buffers will be enforced it is not expected for this loss to occur. Treatments may improve availability of food resources by increasing densities of prey.	The cumulative effects area for this species is the Colville National Forest. There are cumulative effects which will occur to goshawk habitat and individuals due to the overlap of other USFS vegetation restoration projects throughout the cumulative effects area (see Appendix A). These cumulative effects will be the same as direct and indirect effects described for the proposed project. The resulting cumulative effects will include reduction of foraging habitat and a potential increase in availability of food resources for the next 5-10 years. In addition, the potential abandonment of territories will be a potential cumulative effect due to other vegetation management projects. It is not clear how long a territory may be abandoned for after treatment within the nest stand proximity but through the limited amount of monitoring data which has been collected on the forest abandonment can occur for anywhere between one and four years. Any time that the territory has been abandoned reduces the breeding population and could affect the species viability.
Lewis woodpecker	May impact individuals but is not likely to lead in a trend towards federal listing or loss of viability	Could improve Lewis' woodpecker habitat by opening stands and retaining snags, but the amount of this habitat in the watershed, would not dramatically increase the amount of Lewis' woodpecker habitat or affect the Lewis' woodpecker population.	The cumulative effects area for Lewis' woodpeckers consists of lower-elevation lands west of the Columbia River. Relevant past, present, and reasonably foreseeable future actions listed in Appendix A were considered specifically including: other vegetation management projects, wildfires, hazard tree removal, treatment on private lands, and firewood cutting. The beneficial effects for this proposed action would be cumulative to similar effects for other vegetation management projects that are active or proposed within the cumulative effects area. In addition, there would be additional beneficial effects from wildfires which have occurred throughout the area. Wildfires create additional snags which are essential habitat components. Hazard tree removal, treatment on private lands, and firewood cutting would add a negative cumulative effect to Lewis's woodpecker habitat as these actions would reduce the number of snags in the areas in which these actions will occur.
White-headed	May impact individuals but is	Opening stands and retaining larger live trees and	Refer to Lewis' woodpecker as effects are the same.

woodpecker (MIS Species)	not likely to lead in a trend towards federal listing or loss of viability	snags in dry, Douglas-fir/ponderosa pine stands would improve habitat	
Gray wolf	May impact individuals but is not likely to lead in a trend towards federal listing or loss of viability	Improve the forage component of big game winter ranges for 10+ years. Project would move the project area towards a more historic fire regime where big game forage could be maintained.	A characterization of cumulative effects to this species can reasonably be made at the Forest-wide scale. Refer to grizzly bear cumulative effects to forage and seclusion for analysis as effects are the same.
Sensitive bats	May impact individuals but is not likely to lead in a trend towards federal listing or loss of viability	Project activities would either be far enough removed from known bat roost sites to have no effect on species or would be timed to avoid periods that the sites would be occupied. Activities near unknown locations could cause loss of individuals. Project activities would promote a structurally diverse landscape consisting of created openings, thinned stands, and unmanaged forest stands, moving landscape areas towards their historic conditions. Within newly created openings, there would be a flush of herbaceous growth on the forest floor which could provide rich food sources for insect prey.	A characterization of cumulative effects to this species can reasonably be made at the project area scale. Activities occurring within the cumulative effects area considered include treatments on private inholdings within the project boundary, hazard tree removals, and firewood cutting. These activities will reduce the number of snags throughout the project area, potentially reducing the roosting sites for bats. These effects would be cumulative to those resulting from the proposed action.
All sensitive invertebrates	May impact individuals but is not likely to lead in a trend towards federal listing or loss of viability	Less mobile individuals could be killed by heavy equipment/fuel reduction operations. Also, food plants could be damaged or removed due to heavy equipment use/fuel reduction operations. However, the proposed action would open previously closed areas, which may favor host plants creating favorable nectaring conditions and brood-rearing habitat.	The cumulative effects area for sensitive invertebrate species is the Sanpoil project area. Activities considered for cumulative effects include treatment of private land, and grazing. Treatments on private lands would have similar effects to invertebrates as the proposed action along with the likelihood that down logs and wetland areas would have less protections potentially adding a negative effect to invertebrate habitat. The proposed action in addition to grazing would have an added negative cumulative effect to invertebrate habitat within the project area. Grazing has the potential to remove forage and host plants and alter the integrity of meadows and riparian habitats which are vital habitat areas for the sensitive invertebrates found on the CNF.

*Above table is based on the most recent sensitive species list (July 2015) available at the time the Sanpoil project was initiated.

Table 12: Summary of Effects of the Proposed Action on Surrogate Species

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
All Forest Communities/ Medium- Large Trees	Cassin's Finch	Current habitat is below HRV standards, project activities are aimed to improving and moving the watershed closer to HRV standards. Refer to the silviculture report for more details about HRV. Refer to NOGO and GGO for additional details of potential effects.	<p>Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.</p> <p>Loss of large trees- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>)</p> <p>Loss of LSOF (late-successional and old forests)- Habitat is not within HRV standards. Treatment will focus on moving the habitat towards HRV standards, reducing effects of this risk factor thus improving habitat.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance.</p> <p>Alteration of hydrologic regime- Through project activities there will be decommissioning of roads affecting hydrological conditions and other activities such as culvert replacement which will improve the watershed hydrologically and not increase this risk factor. Refer to aquatics report for more details.</p> <p>Fire exclusion- Project treatments are designed to respond to the increased risk of wildfire due to fire exclusion and there will be underburning treatment which will reduce the risk of catastrophic stand replacing wildfires to occur. Refer to fuels report for more details</p>	Cumulative effects can be described at a forest wide scale for this surrogate species /habitat group. These effects will have an impact to this surrogate group for approximately 10-20 years, dependent on the speed of regrowth. Activities considered include wildfires, vegetation management, and grazing. There will be a beneficial effect from this project due to the promotion of large tree growth and movement towards HRV standards, other ongoing and future vegetation management projects will have the same effects. Wildfires, if not high intensity, have provided a beneficial cumulative effect as they move stands towards HRV. Grazing will add a negative cumulative effect of reduction of forage. Overall the cumulative effects of this project, when combined with ongoing and future actions, are insignificant and discountable.	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.
All Forest Communities/ Open Forest	Western Bluebird	Current habitat below HRV standards. The proposed project's intent is to move the abundance of stands within the middle structure closed stage towards open single story late structure stages which will benefit this surrogate species and habitat grouping. Refer to the	<p>Loss of large trees and snags- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>). Plan standards also require retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).</p> <p>Fire exclusion- Project treatments are designed to respond to the increased risk of wildfire due to fire exclusion and there will be underburning treatment which will reduce the risk of catastrophic stand replacing wildfires to occur. Refer</p>	Cumulative effects can be described at a forest wide scale for this surrogate species /habitat group. These effects will have an impact to this surrogate group for approximately 10-20 years, dependent on the speed of regrowth. Activities considered include; other vegetation management projects, wildfires, removal of hazard trees, and firewood cutting. Other	The action will move current vegetation standards closer to HRV benefitting this surrogate species and habitat group. Through project actions and forest plan standards and guidelines risk factors shall be

		silviculture report for more details about HRV.	to fuels report for more details.	vegetation management projects will help to move habitat towards HRV standards adding a beneficial cumulative effect. Wildfires which have occurred in the area also have provided positive effects as they have created openings. Removal of hazard trees and firewood cutting will add a negative cumulative effect through the potential removal of snags. Overall there will be a positive cumulative effect.	reduced. Therefore, the proposed action may affect individuals but are not likely to lead to loss of species viability.
Grass/Shrub	Tiger Salamander	As this habitat type is limited and restricted to areas surrounding riparian areas there is no HRV standard for this habitat. As riparian areas are appropriately buffered from treatment it is unlikely for there to be effects from project activities on individuals or this habitat type.	<p>Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.</p> <p>Invasive Species- There is an increased risk of invasive plant species being spread through project activities but design elements will be put in place to help prevent the spread of invasives. Refer to invasive report for more detail.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance due to presence of project layout, operations, and monitoring.</p>	Even though there are potential increases to risk factors for this habitat group there are no anticipated effects to Tiger Salamanders or the Grass/Shrub habitat type through the proposed project. Therefore, there will be no cumulative effects.	The proposed action will have no effect on this habitat type or individuals.
Medium-Large Trees/ Cool-Moist Forest	American Marten, Pileated Woodpecker	Current habitat is below HRV standards for late closed spruce/subalpine fir habitat and above HRV standards for other cool-moist veg types and structure stages within the project area. Treatment will be focused on reducing densities in this vegetation type. Refer to the silviculture report for more details about	<p>Road density- Project activities will temporarily increase road density through the project area due to the temporary roads needed to provide access to units. In the long term road density will decrease within the project area as temporary roads will be closed after use and restored to hydrologically stable conditions, and additional previously open roads will be decommissioned. Refer to the Environmental Analysis report for more detail.</p> <p>Created openings- Through the reduction of density in this habitat type there will be an increase in created openings but not to a level which would have a negative effect. In fact the opening of these vegetation stands will have an overall positive effect, enhancing the growth of larger trees.</p> <p>Loss of large trees and snags- There will be no increased</p>	Cumulative effects can be described at a forest wide scale for this surrogate species/habitat group. There will be a slight positive effect from this project on foraging habitat within the next 5 years and a slight negative effect on nesting habitat for species in this group which will occur over the next 10-15 years. Overall there will be a slight improvement for habitat due to the opening of stands. This effect should persist for the next 10-15 years. Other vegetation management projects occurring	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.

		HRV.	risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>). Plan standards also require retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).	on the CNF will have similar cumulative effects to old growth associated species and will have effects for 10-20 years.	
Open Forest/Early Successional	Fox Sparrow	Current habitat is within appropriate HRV standards for all forest types except within subalpine fir/lodgepole pine where the current amount of habitat is below desired conditions. Project activities will target middle stage structure types which are above HRV standards and aim to move those stands towards more appropriate structure stages according to HRV.	Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.	Cumulative effects can be described at a forest wide scale for this surrogate species/habitat group. Activities considered for cumulative effects include other vegetation management projects and grazing. This project and other vegetation management projects will have a similar effects in that early successional stages will be promoted through treatment. This cumulative effect will occur for approximately 5-10 years. Grazing will have a negative cumulative effect through the reduction of forbs within this habitat type. The reduction of forbs through grazing will occur indefinitely as long as grazing is permitted in these habitat areas. Overall there will be a beneficial cumulative effect on this habitat type.	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.
Open Forest /Woodland/ Grass/Shrub/ Cave	Fringed Myotis, Pallid Bat	The amount of late open habitat which is ideal for bats is currently below HRV standards. The proposed project will treat mid open structure which is above HRV in order to promote growth of larger trees. For further discussion refer to the silviculture report and for	Loss of large trees and snags- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>). Plan standards also require retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>). Loss of riparian habitat- Riparian habitat will be appropriately protected and treated to standards described in the forest plan and other aquatic standards, therefore no increase in risk. Refer to aquatics report for details.	A characterization of cumulative effects to this species can reasonably be made at the project area scale. Activities occurring within the cumulative effects area considered include: hazard tree removals, and firewood cutting. These activities will reduce the number of snags throughout the project area, potentially reducing the roosting sites for bats. These effects would be cumulative to those resulting from the proposed action and are likely to have an	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.

		additional effects discussion on bat species refer to the BE.	<p>Loss of roost sites- Forest plan standards and guidelines prevent large trees and snags from being removed for harvest and treatments near riparian areas will promote growth of deciduous trees which may be roosts. Therefore, project activities will not increase chance of this risk factor.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance.</p> <p>Insecticides- No use of insecticides will occur through project activities, no increase in this risk factor.</p>	effect for 10-20 years.	
Open Water/Snag Habitat	Wood Duck	Open water habitat will not be affected by project activities, there are no HRV standards for open water habitat. Large snags are below HRV standards. There will be no reduction of large snags through project activities and there will be a positive effect on this habitat type through treatment goals of promoting growth of large trees.	<p>Loss of snags- There will be no increased risk due to forest plan standards requiring retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance during layout, implementation, and project monitoring.</p>	Cumulative effects can be described at a forest wide scale. Activities which will contribute to cumulative effects include; other vegetation management projects, hazard tree removal, and firewood cutting. These activities may result in a reduction of snags along roadways and if nearby open water will have a negative effect on wood ducks and this habitat type. Other vegetation projects will have similar effects as this proposed project adding a beneficial cumulative effect. These cumulative effects are expected to effect this habitat type for 10-20 years.	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.
Riparian/ Pond/Small Lake/ Backwater/ Wetland / Open Water/Wet Meadow	Wilson's Snipe, Columbia Spotted Frog	Riparian areas as listed will be treated according to forest plan and other aquatic standards. There are no HRV standards for this habitat type. It is unlikely for there to be effects from project activities on individuals or this habitat type.	<p>Invasive Species- There is an increased risk of invasive plant species being spread through project activities. Refer to invasive report for more detail.</p> <p>Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.</p> <p>Road density- Project activities will temporarily increase road density through the project area due to the temporary roads needed to provide access to units. In the long term road density will decrease within the project area as temporary roads will be closed after use and restored to hydrologically stable conditions, and additional previously open roads will be decommissioned. Refer to transportation</p>	As there are no anticipated effects from project activities on this habitat type or individuals there will be no cumulative effects.	The proposed action will have no effect on this habitat type or individuals.

			<p>report for more detail.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance.</p> <p>Fire exclusion- Project treatments are designed to respond to the increased risk of wildfire due to fire exclusion and there will be underburning treatment which will reduce the risk of catastrophic stand replacing wildfires to occur. Refer to fuels report for more details</p>		
Riparian/ Shrubby Deciduous	MacGillivray's Warbler (MIS Species)	Riparian areas as listed will be treated according to forest plan and other aquatic standards. There are no HRV standards for this habitat type. It is unlikely for there to be effects from project activities on individuals or this habitat type.	Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.	As there are no anticipated effects from project activities on this habitat type or individuals there will be no cumulative effects.	The proposed action will have no effect on this habitat type or individuals.

Table 13. Summary of effects to other species groups

Species	Effects Determination	Cumulative Effects
Big game (Elk and Deer spp.) (Species of management interest)	The proposed project will have temporary negative effects on big game species due to an increase in human activity within the project area. In the long-term project activities will improve forage habitat conditions and maintain appropriate levels of hiding cover, moving habitat towards the HRV. All LMP guidelines will be incorporated into project design. Therefore, the project as proposed will not contribute to a negative trend in viability of big game populations on the CNF.	Cumulative effects were examined at a forest wide scale and analyzed over the next 5-10 years. Cumulative effects would result due to overlap of other USFS vegetation restoration projects across the forest. These cumulative effects would be the same effects as described under direct and indirect effects for human activities/zones of influences for this project. Cumulative effects include improvement of foraging habitat due to harvest activities promoting understory growth, temporary displacement of individuals due to an increase in human activity, and a potential reduction of the zone of influence through road closures after the project is completed. Additionally, past wildfires in the project area have reduced hiding cover availability, as could potential future wildfires. However, this initial decrease in hiding cover would improve forage habitat within 5-10 years.

Species	Effects Determination	Cumulative Effects
Snags and coarse woody debris (Important habitat for primary and secondary cavity-nesting species, mammals, and invertebrates.)	Thinning treatments should accelerate the development of large trees in the project area leading to, over the long term, large diameter snags and down logs. Reductions of ladder fuels and tree crown biomass should reduce the potential for hot, crown fires to occur in the project area. All logs that are in later stages of decay would be left on site. Following harvest created openings have the potential for increased wind-thrown trees that would add to downed wood. Mechanical fuels treatments would impact non-commercial sized trees only so would have insignificant or discountable effects to dead wood habitats. Low mortality rates for overstory trees from prescribed fire may cause a small pulse of snags created in burned areas, leading to future downed wood material. Overall the proposed action would move the landscape closer to its historic fire regime, therefore closer to appropriate HRV standards. Based on the predicted project effects and given the design elements, the proposed project should not contribute to a negative trend in viability for dead wood habitat.	The cumulative effects analysis area for primary cavity excavators is the Colville National Forest. Effects were analyzed for 5-20 years. Relevant past, present, and reasonably foreseeable future actions were considered including other vegetation management projects, hazard tree removal, firewood cutting, and wildfires. This project should accelerate the development of large trees in the project area and should lead to large diameter snags and down logs. Through project actions overall the extent of hardwoods could increase in the project area, eventually providing high quality cavity excavator habitat as these trees mature. These and other effects of this project are similar and cumulative to effects of other vegetation management projects occurring on the Forest. Hazard tree removal and firewood cutting will reduce the number of future available natural snags on the landscape, having a negative cumulative effect. Wildfires which have occurred on the Forest have provided a large amount of snags and down wood which contributes to the cumulative effects as a beneficial impact.
Landbirds	The proposed activities affect a small amount of habitat relative to the overall ranges of the birds that use the environments that occur in the area, and none would significantly impact riparian areas. Nearly all the proposed commercial harvest would move conditions in the project area from the more closed, middle structural stands to a more diverse condition with openings and blocks of retained, untreated patches similar to what was present on the landscape historically. The project would meet the intent of the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman & Bresson, 2017) and all other management direction related to landbirds. Thus, we expect the project would not influence the continued viability of Landbird species across the forest.	The cumulative effects area for migratory birds is northeast Washington. Cumulative effects are analyzed from 5-20 years. For all land surrounding the project area, migratory land bird habitat conditions have been affected by a wide variety of management and activities and natural processes, such as timber harvest, grazing and fire suppression has reduced much of the habitat diversity that occurred across the project area when fires actively burned, especially on the lower elevations of the project area. The cumulative effects of the above activities have been proportionally greater in those habitats that historically have been transitory in nature and/or in limited supply such as openings, shrub fields, riparian habitat, early successional forests, and single stratum forest types than in the general coniferous forest environment. Current and future management activities on NFS lands that maintain or improve these types of habitats contribute cumulatively to the perpetuation of bird species that require these conditions and the maintenance of the area's bird species diversity.

3.4.2 Soil

The soils analysis will focus on the effects of mechanical treatments including timber harvest and fuel reduction activities to the soil resource and comparing anticipated soil effects to Regional and LMP Soil Quality Standards and Guidelines.

Under the no action alternative natural recovery of compacted soils would continue over the next 20-60 years. Existing old non-system roads would slowly recovery over a decade or century scale. Soil cover, soil hydrologic function, the rate, size and frequency of surface soil erosion, and mass wasting events would not change with the no action alternative. Depth of forest floor, quantity of fine, and coarse wood will continue to accumulate above the historic range of variability. The natural rates of soil microbial processes and nutrient cycling would continue with no detrimental impairment. Wetlands will continue to degrade or recover dependent on natural processes. The natural rates of soil microbial processes and nutrient cycling would continue with no detrimental impairment. Fuel loading without natural fire processes would continue to occur with increasing potential for a high severity fire to cause detrimental impacts to the soil quality and soil productivity.

Under the proposed action, detrimental soil conditions would increase to thresholds that are below Regional and LMP Soil Quality Standards and Guidelines. Ground based timber harvest units with subsequent grapple piling treatments would approach 18% detrimental soil conditions that would recover over the short and long term depending on the degree of site specific disturbance. Most units of mechanical treatment would remain under 15% detrimental soil condition with the majority of the detrimental disturbance from soil compaction followed by soil rutting (conditions defined by Soil-Disturbance Field Guide (Napper et al., 2009)). Detrimental soil conditions are expected to recover in the long term. Soil erosion is not expected to increase in a measurable way. There would be short-term adverse effects to soil function and soil productivity but overall soil conditions and long-term effects would be beneficial as forest stands return to historic and natural range of variability via thinning and prescribed fire treatments.

The construction of approximately 4 miles of new temporary roads would inhibit soil productivity on approximately 15 acres (estimated 30 feet impact width) for the long term; more than 50 years. The new temporary roads would also disconnect hillslopes from hydrologic function across the landscape as the road prism interrupts and diverts horizontal flow of water through the soil pedon. The new temporary roads would also reduce soil microbial activity, reduce soil carbon, and create areas of detrimental soil erosion as flows are concentrated and then diverted off the road prism. These effects are long-term on the landscape; 20 to 100 years depending on site specific attributes. Effects of road decommissioning would vary but would improve soil conditions on approximately 10 acres, with recovery of detrimental soil conditions occurring over the long term.

The proposed action would not detrimentally degrade soil resources beyond standards and guidelines due to treatment prescriptions and characteristics of the landscape involved and would have positive impacts on watershed and wetlands in the project area. Restoration activities (road decommissioning and culvert upgrades) would increase watershed function over the long term and protect watershed values over the short and long term, with the potential to restore hydrologic function on 8 acres due to decommissioning of temporary roads. Wetland function would improve over the short and long term due to restoration actions proposed and protection of wetlands designated in project design elements. Direct, indirect, and cumulative effects would be addressed with the design elements and best management practices.

The analysis area for effects analysis to soils is the treatment unit or activity area. Effects on soil productivity are site specific and not spatially mobile over the analysis area. There are no other past, present, or reasonably foreseeable future actions that are expected to substantially increase the detrimental soil condition in the project area. There is no overlap in time and space. Effects are described in the direct and indirect effects in the

previous sections. There are no quantifiable cumulative effects as a result of the proposed action in terms of soil function, soil erosion, soil organic matter, watershed function, and wetland function resource elements. This is due to the bounding of the analysis on the actual activity area footprint.

There are no Prime Farmlands within the planning area and the project as designed is compliant with Executive Order 11988.

3.4.3 Range

The two range attributes that will be focused on are; the increase in transitory range and the changes to natural barriers within the Quartz allotment. Treatments implemented on the landscape would increase the amount of transitory range available for livestock use and have the potential to change natural barriers due to changing existing vegetation.

The no action alternative would result in no timber harvest, pre-commercial thinning, or prescribed fire activities within any portion of the Sanpoil Project Area. Short-term effects of this alternative would result in little or no change in the range resource compared to the existing condition. Livestock would continue to graze on the allotment and range improvements would exist on the landscape and be used to manage grazing. Long-term effects of the no action alternative would be the perpetuation of denser stands of small diameter trees which are currently providing little value for production of forage. The no action alternative would also allow conifers and woody species to continue encroaching into the more open and grassy areas of the allotments and thereby reduce the forage producing capability of the allotment. If encroachment were to occur for upland grassy areas, then it is likely there would be increased grazing pressure in riparian areas. Range improvements would be at greater risk of being damaged or destroyed due to increased likelihood of higher severity fire.

The proposed action would increase foraging as treatments would add 10,585 capable acres to the Quartz allotment, increasing capable acres to 41,242. Treatments would decrease intensity of livestock grazing achieving better distribution on the landscape with an increase to 126 acres per cow/calf pair. Water quality and overall riparian health would benefit from better distribution and transitory rangeland being created in the uplands of the allotment, which falls directly in line with the purpose and need of the Sanpoil Project. Other treatment effects include possible changes in current natural barriers that would cause additional range improvement infrastructure in order to control livestock, though treatments would not impact current range improvement infrastructure.

The spatial boundaries for analyzing cumulative effects to rangelands are limited to the allotment boundaries for the Quartz allotment, as no other allotments are impacted by the project. The temporal boundaries for analyzing effects are from the time of project implementation to 30 years in the future due to transitory range being temporary. The Sanpoil project would produce some effects regarding a change in livestock management, habituation of livestock on the landscape, effects to range infrastructure, changes in natural barriers and changes to the stocking rate. However, the activities in the proposed action combined with past, ongoing and reasonably foreseeable future actions would not cumulatively affect range management within the Quartz allotment.

LMP direction requires coordination of timber harvesting and related activities with the allotment management plan. LMP direction and consistency is addressed through the development and implementation of prescriptions and design elements in the proposed action.

3.4.5 Special Uses and Minerals

There are no adverse impacts (direct, indirect, or cumulative) anticipated to improvements authorized under

special use permits, or to locatable mining claims if the recommended design elements are implemented. Effectiveness of the design elements in avoiding impacts to improvements is expected to be very high and success (ability to implement the measure) would also be very high.

3.4.6 Cultural/Heritage Resources

Archaeological sites located in thinning units may be directly impacted by road construction or timber harvesting activities. Treatments could also cause increased visitor use due to increased accessibility from clearing of vegetation and/or the creation of roads. However, the Sanpoil project, with the proposed heritage design elements, meets LMP standards for Heritage Resources and Federal regulations concerning Heritage Properties (National Historic Preservation Act and its implementing regulations at 36CFR800), and would result in no effects to cultural resources as a result of the project.

Cumulative effects were analyzed at the project scale. This scale was chosen for effects analysis because of LMP direction, similar conditions and similar study areas. Implementation of design elements would ensure that all project actions would have no effect on heritage resources.

A government-to-government meeting between the Colville Confederated Tribes and USFS archaeologists occurred on November 2, 2017 for the purpose of information sharing about the project. Because of the meeting and correspondence, the tribes had no concern with the proposed undertaking/project.

3.4.7 Botany

Under the no action alternative, sensitive plants would remain undisturbed except in the case of wildlife and natural events (fire, flooding, hail and severe wind) or climate change impacts. The risk of direct impacts to known or undiscovered sensitive plant populations as a result of project activity would be eliminated. Noxious weeds spread would be reduced with this alternative.

There are no federally listed threatened, endangered, or proposed plant species known or suspected in the project area, and none were found during surveys. Only one USFS sensitive plant species, whitebark pine (*Pinus albicaulis*), occurs in the Sanpoil project area, but proposed treatments are outside of occupied habitat for this species. Proposed actions are unlikely to affect sensitive plants if design elements are implemented.

The spatial boundary for analyzing cumulative effects on sensitive plants includes the footprint of activity area disturbances (harvest and burn units and road construction) with road construction areas being buffered 100 feet to account for the area that could be disturbed. The temporal boundary for cumulative effects in the short term will range from implementation to five to eight years depending on the implementation schedule for the actions, while long-term effects may be apparent ten or more years after. When the effects of past, present, and reasonably foreseeable activities are combined with the anticipated effects from the proposed activities, sensitive plants may be impacted, but their viability in the planning area is expected to be maintained due to unaffected habitat and occurrences remaining inside the project area and additional occurrences being present on the forest.

Both alternatives (no action and proposed action) would comply with the Endangered Species Act because no federally listed or proposed species or their habitats would be affected. All alternatives would maintain viable populations of native plants and the proposed activities were reviewed for potential effects on candidate and sensitive species, and thus would be compliant with Forest Service Manual direction. Both alternatives would also comply with the Colville National Forest's LMP in that the ecological conditions and processes that sustain the habitats currently or potentially occupied by sensitive plant species would be retained; the

geographic distributions of sensitive plant species in the LMP area would be maintained; and field surveys were conducted in suitable habitat.

3.4.8 Invasive Plants

Given that several different species of invasive plants occur within the project area and that some of the non-Forest Service lands bordering the Sanpoil project are infested with them, it is likely that invasive plants would continue to occur within the project area under a no action alternative. Given similar abilities and funding to treat invasive plants in the future it is expected that the overall number of acres infested would rise and fall, but slightly increase compared to current levels.

The Proposed Action could add an additional 661 acres of soil disturbance within the project area which could potentially allow invasive plants to establish in areas where they do not currently exist. The amount of potential invasive plant habitat resulting from proposed actions is not likely to create a substantial increase in the amount of acres infested with invasive plants within the project area if design elements and standard practices are followed and continued invasive plant treatment occurs.

Cumulative effects for invasive plants were analyzed at the project scale due to the level at which activities would change the landscape and potentially the risk for invasive plant establishment and spread. Relevant past, present, and reasonably foreseeable future actions listed in appendix A were considered and no projects would have an effect on invasive plants because they do not have the potential to contribute to the amount of invasive plants or the spread of invasive plants due to temporal or spatial separation allowing for invasive plants to remain within relevant thresholds. Therefore, by adhering to design elements and management practices under management objectives 3, 5, 6 and 7 of the *Colville National Forest Noxious Weed Prevention Guidelines*, invasive plant populations are not likely to spread substantially and could likely decrease.

3.4.9 Recreation

No immediate change would occur to roadless area characteristics for the Cougar Mountain, Thirteen Mile, or Bald-Snow IRA for the No Action Alternative. Under this alternative, the existing vegetative, cultural, landscape, recreation opportunities, habitat, soil, water, and air quality conditions would remain unaltered. Over time, however, the likelihood of a large fire event within the planning area would increase as dead fuels continue to build-up on the forest floor and ladder fuels continue to grow in the understory. Should a large fire event occur, the basic roadless area character (no roads and no commercial timber harvest) would still apply to the three IRA within the Sanpoil Project area and there would likely be no reduction in the number of acres that would be suitable for designation as an IRA under the 2001 Roadless Area Conservation Rule. However, depending on the severity and location of the burn, impacts to cultural properties, scenic quality, water and air quality, soil conditions, habitat, and recreational opportunities would be likely.

Proposed activities include approximately 192 acres of shaded fuel breaks, 96 acres of hand pile burning, 96 acres of hand pile and machine pile burning, and 4,020 acres of underburning within the three IRA in the Sanpoil Project Area. Implementation of shaded fuel breaks, ladder fuel reduction and hand and machine pile burning treatments would likely reduce the quality of the existing semi-primitive non-motorized classes of dispersed recreation and the natural appearing landscapes along the perimeter of the IRA adjacent to FRs 2050600, 2054, and 2100500. However, underburning would likely have no effect on the roadless area characteristics of the three IRA as it would be implemented under conditions that would mimic a natural fire regime. Also, underburning would likely benefit the quality of the natural appearing landscape and habitat for those species dependent on large, undisturbed areas of land on approximately 4,020 acres within the IRA. There would be no reduction in the number of acres suitable for designation as an IRA under the 2001 Roadless

Area Conservation Rule since the affected IRA would not contain any new roads or commercial harvest treatments.

The spatial boundaries for analyzing the effects to recreation resources includes all NFS lands north of the boundary with the Colville Indian Reservation, west of the Republic/Three Rivers Ranger District boundary, south of State Highway 20, and east of State Highway 21. This area represents the area of potential impact to recreation resources associated with the Sanpoil Project. Temporal boundaries of 5 to 15 years for analyzing the effects to recreation resources allow five years for the implementation of vegetation harvest followed by ten years to implement prescribed burning activities. However, the timeline associated with the immediate effects of harvesting or burning within specific units on recreation resources are generally short-term (less than 1 year). Relevant past, present, and reasonably foreseeable future actions listed in appendix A were considered. None of these actions would have a cumulative effect on the number of acres suitable for designation as an IRA under the 2001 Roadless Area Conservation Rule. The only two projects on the list that overlap in space are grazing and the construction of segments of the Pacific Northwest National Scenic Trail which are both compatible uses within IRA.

3.4.10 Climate Change

The Intergovernmental Panel on Climate Change has summarized the contributions to climate change of global human activity sectors in its Fifth Assessment Report (IPCC 2014). In 2010, anthropogenic (human-caused) contributors to greenhouse gas emissions came from several sectors:

- Industry, transportation, and building – 41%
- Energy production – 35%
- Agriculture – 12%
- Forestry and other land uses – 12%

There is agreement that the forestry sector contribution has declined over the last decade (IPCC, 2014; Smith et al., 2014; FAOSTAT, 2013). The main activity in this sector associated with GHG emissions is deforestation, which is defined as removal of all trees, most notably the conversion of forest and grassland into agricultural land or developed landscapes (IPCC 2000).

This fuels reduction project does not fall within any of these main contributors of greenhouse gas emissions. Forested land will not be converted into a developed or agricultural condition. In fact, forest stands are being retained and thinned to maintain a vigorous condition that supports trees and sequesters carbon long-term. U.S. forests sequestered 757.1 megatonnes of carbon dioxide after accounting for emissions from fires and soils in 2010 (US EPA, 2015). However, there is a growing concern over the impacts of climate change on U.S. forests and their current status as a carbon sink. There is strong evidence of a relationship between increasing temperatures and large tree mortality events in forests of the western U.S. There is widespread recognition that climate change is increasing the size and frequency of droughts, fires, and insect/disease outbreaks, which will have a major effect on these forest's role in the carbon cycle (Joyce et al. 2014).

The project is in line with the suggested practice of reducing forest disturbance effects found in the National Climate Assessment for public and private forests (Joyce et al. 2014). The Sanpoil Project proposes to reduce stand densities to increase resistance to insect mortality and to use thinning and prescribed fire to increase resistance and resilience to wildfire. The release of carbon associated with this project is justified given the overall change in condition would increase forest resistance to release of much greater quantities of carbon from wildfire, drought, insects/disease, or a combination of these disturbance types (Millar et al. 2007). This project falls within the types of options presented by the IPCC for minimizing the impacts of climate change on forest carbon and represents potential synergy between adaptation measures and mitigation. Actions aimed

at enhancing forest resilience to climate change by reducing the potential for large-scale, catastrophic disturbances such as wildfire also prevents release of GHG and enhances carbon stocks (Smith et al. 2014). The proposed action represents the rationale behind these recommendations because it is designed to restore and maintain stand resiliency to insect and disease outbreaks and fire disturbance. Treatment units are proposed across the landscape to correspond to the areas where fuels and insect and disease problems are considered outside the natural range of variation in the watershed and where the location of fuels could cause undesired consequences. Careful implementation of the treatments should help increase forest resilience to disturbance and create and promote a larger scale mosaic by minimizing the amount of area that is involved in a single wildfire incident.

Timber management projects can influence carbon dioxide sequestration in four main ways: (1) by increasing new forests (afforestation), (2) by avoiding their damage or destruction (avoided deforestation), (3) by manipulating existing forest cover (managed forests), and (4) through transferring carbon from the live biomass to the harvested wood product to the carbon pool. Land-use changes, specifically deforestation and growth, are by far the biggest factors on a global scale in forests' role as sources or sinks of carbon dioxide, respectively (IPCC, Intergovernmental Panel on Climate Change, 2000). Projects, like the proposed action that create forests or improve forest conditions and capacity to grow trees, are positive factors in carbon sequestration.

3.5 Consistency with Law and Regulation

3.5.1 Clean Air Act and Washington State Clean Air Act

The proposed action would adhere to the State of Washington Department of Natural Resources Smoke Management Plan (1998). Burn permits would be obtained for burning activities as per the Smoke Management Plan. The Smoke Management Plan meets the requirements of the Washington State Clean Air Act and the United States Clean Air Act.

3.5.2 Clean Water Act

This project complies with the Clean Water Act. South Fork O'Brien is a water of concern for dissolved oxygen (DO), however the effects of this project are unlikely to affect DO because the distance of treatments from the stream makes any affect to particulate organic matter delivery to the streams highly unlikely. Temperature is unlikely to change because of design criteria and changes to DO of South Fork O'Brien are not expected since the stream bed is not anticipated to be affected by the project. Temperatures are within state standards and the very small shading changes are very unlikely to affect temperature enough to exceed state standards. South Fork O'Brien is a category 2, suspect waters for pH and the treatment design is highly unlikely to affect particulate organic matter delivery to the streams due to the distance from the streams. Though both South Fork O'Brien and Thirteenmile Creek are category 2 waters for bacteriological contamination, the standard practice to dewater crossings or install temporary crossings during dry conditions would prevent indirect effects of livestock adding bacteriological contamination and therefore is anticipated to prevent violation of the Clean Water Act.

See the aquatics report in the project record for more details.

3.5.3 Endangered Species Act

The agency has completed consultation with the U.S. Fish and Wildlife Service for this project and complies with the Endangered Species Act. The U.S. Fish and Wildlife Service concurs that the proposed project is not likely to adversely affect grizzly bear, Canada lynx, or wolverine. The project as proposed would be consistent with LMP standards and guidelines for TES and other wildlife and USDI (2001). The project would be consistent with standards, guidelines, and recommendations in the Grizzly Bear Recovery Plan (USFWS 1993) and other guidance for grizzly bears (USDI et al. 1986, USDA 2011). The project would be consistent with

management recommendations in the Lynx Conservation Assessment and Strategy (LCAS) (Interagency Lynx Biology Team 2013). In addition, the project would adhere closely to management recommendations in existing conservation assessments and other guidance for sensitive wildlife species, as described in the BE. The project would have no effect to the viability of wildlife.

3.5.4 National Forest Management Act

The project is consistent with the LMP. See the silviculture resport in the project record for details.

All stands with a regeneration harvest prescription would be restocked within five years.

3.5.5 National Historic Preservation Act

The project complies with the National Historic preservation through the proposed design elements and standard practices. Consultation with federally recognized tribes is ongoing.

3.5.6 Non-native Invasive Species (Executive Order 13112)

The project includes design elements and standard practices to prevent the introduction of invasive species and to detect and rapidly respond to and control populations. See the invasive plants report in the project file for details.

3.5.7 Protection of Wetlands (Executive Order 11990)

Through the implementation of the design elements, standard practices and Best Management Practices, wetlands would be protected under the proposed action.

3.5.8 Environmental Justice (Executive Order 12898)

There are two populations that meet the criteria for an environmental justice population that have the potential to be impacted by the Sanpoil project:

1. The Confederated Tribes of the Colville Reservation
2. Low-income residents of Ferry County.

The National Forest is used by the above mentioned populations for recreation or to gather forest products such as firewood, game species, and huckleberries. The proposed action should not significantly restrict or inhibit the gathering of firewood, huckleberries or hunting of game animals. Where access and landing space permit, slash removal by the public for personal use firewood would be allowed and encouraged. The Sanpoil Project would provide the same or slightly more firewood gathering opportunities in areas where biomass or leave tops attached is the selected surface fuel treatment. Mule deer habitat (and consequently hunting) would improve as well as sight distance would increase in treated stands. The availability of huckleberries may improve with the opening of closed forest canopies and the reintroduction of fire.

Based on the composition of the affected communities, along with cultural and economic factors, the activities that are proposed would not have a disproportionately adverse effect to human health and safety, or environmental effects to minorities, those of low income, or any other segments of the population. There are no significant negative direct, indirect, or cumulative effects relative to issues of environmental justice through the implementation of the action alternative.

4.0 Agencies and Persons Consulted

United States Fish and Wildlife Service

United States Environmental Protection Agency
Washington State Department of Natural Resources
Stevens County Commissioners
Ferry County Commissioners
Confederated Tribes of the Colville Reservation
The Kalispel Tribe of Indians
The Spokane Tribe
Sierra Club Upper Columbia River Group
Northeast Washington Forestry Coalition
American Forest Resource Council
Kettle Range Conservation Group
Alliance for the Wild Rockies
Conservation Northwest
WildLands Defense

Appendix A Past, Present, and Reasonably Foreseeable Future Actions

The cumulative effects discussed in this section include an analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and substantial relationship to those effects. The cumulative effects of the proposed action and the alternatives in this analysis are primarily based on the aggregate effects of the past, present, and reasonably foreseeable future actions. Individual effects of past actions are not listed or analyzed and are not necessary to describe the cumulative effects of this proposal or the alternatives.

The cumulative effects analysis in this document is consistent with National Environmental Policy Act Regulations (36 CFR 220.4(f)) (July 24, 2008) which states, in part, “CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions...The agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects.”

Areas of analysis are listed for each scale referenced in chapter 3, cumulative effects sections. The tables below list past, present and reasonably foreseeable future actions that were considered in cumulative effects analysis.

PRJ_Year

1986 - 1989

1990 - 1999

1999 - 2009

2011 - 2017

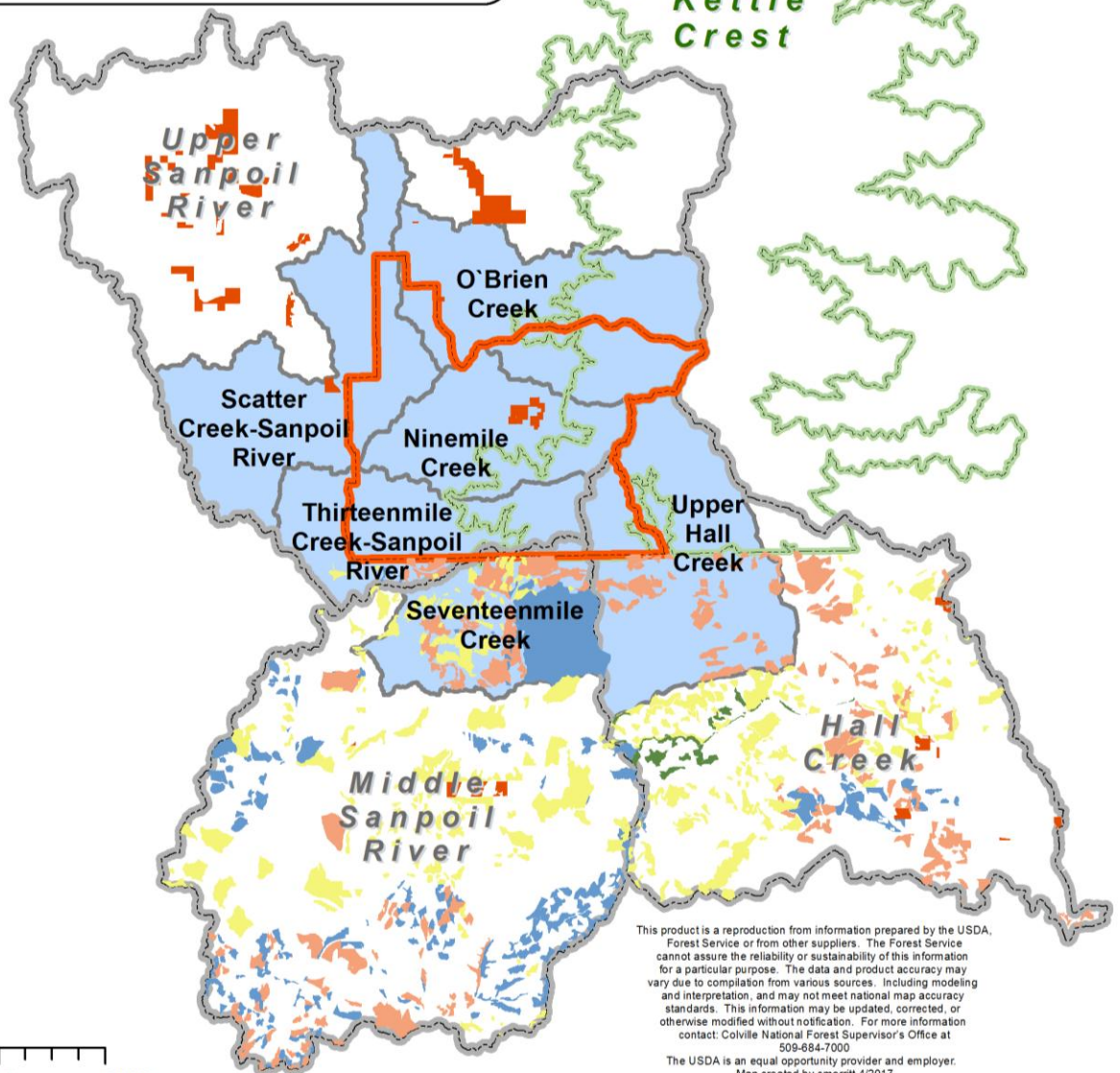
Active Forest Practices Applications

Project-Boundary

Watershed 5th Level Unit (HUC10)

KettleCrest-4000ft

Subwatershed 6th Level Unit (HUC12)



0 1.75 3.5 7 Miles

This product is a reproduction from information prepared by the USDA, Forest Service or from other suppliers. The Forest Service cannot assure the reliability or sustainability of this information for a particular purpose. The data and product accuracy may vary due to compilation from various sources. Including modeling and interpretation, and may not meet national map accuracy standards. This information may be updated, corrected, or otherwise modified without notification. For more information contact: Colville National Forest Supervisor's Office at 509-684-7000

The USDA is an equal opportunity provider and employer.

Map created by cmeritt 4/2017
T:\FS\NFS\Colville\Project\WZone\repeasanpoil2014\GIS\Workspace\cmeritt\EA-Standard-Maps\Analysis\Scales7.2017.mxd

Table 14. Past Actions that may contribute to Cumulative Effects

Past Actions	Timing	Description	Residual Effects
Aquatics			
Upgraded aquatic organism passage on the 2050-600 road where it crosses Ninemile creek.	2014	Install new bottomless arch to allow aquatic organisms to pass and provide passage for 100 year floods.	Would allow aquatic organisms to move upstream of the old culvert and utilize the upper reach.
Road Access			
Resurfacing six miles of road from 2350-000 to Obrien Creek	2017	Recondition and place aggregate along the 2053 road. Replace one 18” pipe and seed for turf reestablishment in disturbed areas.	Reduction in sediment input to Ninemile creek. In some cases previous fires have changed vegetation conditions by killing trees or burning up dead wood. In some cases, snags were created but their tenure on the landscape varies depending on fire intensity and weather. In most cases the fires are not continuing to have an effect that would influence the cumulative effects analysis. These fires have contributed to the existing condition and would be analyzed as part of the existing environment.
Wildfires			
White Mountain Fire	1988	5,588 acers burned in the project boundary for Sanpoil 16,395 acres in the Watershed Analysis Scale (in Hall Creek and Upper Sanpoil River watersheds)	Contributed to current tree size/structure and species composition. The White Mountain fire is in the northeast portion of the project area and more recovered over the past 30 years, than the Northstar fire which burned only three years ago and lies just to the west of the project area.
Northstar Fire	2015	43,083 acres in the Watershed Analysis Scale in the Middle Sanpoil River and Upper Sanpoil River watersheds	
Vegetation Management/Fuels Reduction Projects—Past Harvest			
Commercial Harvest	Note: listed treatments by decade are from the Forest Services’ Activity Database (FACTS); additional treatments are known to have occurred, this is not mean to be an exhaustive list of every acre treated but rather an approximation of the types of treatments that led to the current conditions in the project area.		
	1950s	1,120 acres of commercial thinning, 3,290 acres of regeneration harvest 0 acres PCT	Thinning, regeneration harvest and other management has occurred throughout the planning area. Past harvest has contributed to the current vegetative structure in the area and Reflected in the current condition assessment for forested vegetation and fuels.
	1960s	875 acres commercial thinning, 50 acres precommercial thinning (PCT), 3,056 acres regeneration harvest	
	1970s	1,520 acres commercial thinning, 4,700 acres precommercial thinning (PCT), 1,730 acres regeneration harvest	
	1980s	50 acres commercial thinning, 2,020 acres precommercial thinning (PCT), 3,260 acres	

Past Actions	Timing	Description	Residual Effects
		regeneration harvest	Thinning, regeneration harvest and other management has occurred throughout the planning area. Past harvest has contributed to the current vegetative structure in the area and Reflected in the current condition assessment for forested vegetation and fuels.
	1990s	1,960 acres commercial thinning, 1,790 acres precommercial thinning (PCT), 630 acres regeneration harvest	
	2000s	0 acres commercial thinning, 450 acres precommercial thinning (PCT), 0 acres regeneration harvest	
	2010s	400 acres commercial thinning, 0 acres precommercial thinning (PCT), 0 acres regeneration harvest	
CCT Harvest in the three watersheds that overlap the Sanpoil Project Area	1980s	Treatments of all types occurring between 1980 and 1989, rough estimate based on interpreted data 9,385 acres treatment	Harvest has either been completed or is planned for the decade listed. Most treatments occur south of the Sanpoil project area and very few treatments fall into the Upper Sanpoil River Watershed.
	1990s	Treatments of all types occurring between 1990 and 1999, rough estimate based on interpreted data 21,680 acres treatment	
	2000s	Treatments of all types occurring between 2000 and 2009, rough estimate based on interpreted data 16,733 acres treatment	
	2010s	Treatments of all types occurring between 2010 and 2017, rough estimate based on interpreted data 991 acres treatment	
Commercial Harvest on Private Land in the three watersheds that overlap the project area	July 2018 (estimated start of harvest) through December 2018	Active Forest Practices Applications in the three watersheds that overlap the project area (includes Upper Sanpoil, Middle Sanpoil, and Hall Creek Watersheds) Even-age harvest 132 acres Uneven-aged harvest 885 acres Salvage 152 acres	Harvest has been authorized by the DNR and may occur at any time during the application period. Cutting would be generally limited to smaller private holdings and could be either even aged or uneven aged harvest as noted.
	2019	Even-aged harvest 803 acres Uneven-aged harvest 87 acres	
	2020	Even-aged harvest 623 acres Uneven-aged harvest 1,629 acres	
	2024	Even-aged harvest 64 acres Uneven-aged harvest 401 acres	
	2026	Even-aged harvest 401 acres	
	2027	Uneven-aged harvest 317 acres	
Commercial Harvest on Private Land in the project area	2018-2020	Even-aged harvest 427 acres	Harvest has been authorized by the DNR and may occur at any time during the application period.

Past Actions	Timing	Description	Residual Effects
			Cutting would be generally limited to smaller private holdings and could be either even aged or uneven aged harvest as noted.
Swan Lake 250 acre Overstory Removal	2016	Removal of fire-killed overstory trees in areas of high recreation use. Stands were previously popular for dispersed camping, hunting, and berry picking.	By removing unsafe overstory trees, and promoting a healthy green and growing understory, these areas would continue to see high levels of recreation use in the future. Stands would be converted to early seral stage, as newly established young trees begin to grow.

***Past activities listed here created current forest structure and associated wildlife habitat. These past activities can be considered in most cases as best analyzed by describing the current condition.**

Table 15. Ongoing or reasonably foreseeable future actions that may contribute to cumulative effects.

Project Name/Activity	Timing	Description	Predicted or Ongoing Effects
Vegetation Management/Fuels Reduction Projects			
Roadside Hazard Tree Projects	2016, 2017, 2018	Removal of hazard trees within roughly 150 feet of either side of all roads within the fire perimeter	Removal of dead or dying trees along the roadside would reduce the number of snags immediately adjacent to the roadways.
Removal of Hazard Trees from Developed Recreation Sites Along Highway 20	Ongoing	Removal of hazard trees which pose a threat to recreation users. Assessment will follow developed site danger tree guidance.	Slight reduction over time of snags in developed recreation sites. Effects should continue the current trend as danger tree management has been ongoing for years.
Windstorm Understory Treatments	2017, 2018	Understory treatments including whip falling and PCT are to be completed in 2017. Treatments are likely to be completed by 2019.	Treatments in the understory are aimed at allowing good growth of remaining trees.
Sherman Pass Project	2018-2020	Treatments would include commercial harvest and fuels reduction. A portion of this project is in the watershed area but does not overlap with the Sanpoil project.	Removal of green and dead and dying trees across the project area. Follow up treatments would include prescribed burning and small pine thinning. Treatments could also result in changes to livestock management, habituation of livestock to the landscape, changes in natural barriers, and changes to the available forage base.
Prescribed Burning	Present/ongoing	The republic district has many acres slated for prescribed burning. In any given year the district conducts burns in the spring and fall seasons. As smoke emissions can be approved, conditions	Prescribed burning would result in consumption of surface fuels and blackening of some residual trees would cause short term visual impacts. Smoke would be produced but effects would be very temporary lasting only a few days.

Project Name/Activity	Timing	Description	Predicted or Ongoing Effects
		warrant, and staffing is available.	
Treatment of Private Land north of McMann Creek	2017	The Northstar fire burned a portion of a large privately held parcel of timber land in 2015. The owner plans to begin salvage dead and dying trees.	Removal of snags along with temporary disturbance from logging equipment and temporary road construction needed to access timber.
Range			
Grazing	Present/ongoing	The Quartz allotment overlaps with the Sanpoil project area. Grazing is currently permitted for 328 cow/calf pairs.	Cows graze this pasture for a season of use between June and October 31. Allotment is managed under a three pasture deferred rotation grazing system.
Invasive Plant Treatments			
Invasive Plant Treatment	Ongoing	Weed sites in and around the project area are slated for eradication via herbicide spraying by Ferry County.	Treatments will result in a reduction in the extent of invasive plant sites and better prevention of establishment and spread.
Recreation & Transportation			
Sherman Pass BPA Powerline Management	Ongoing	Ongoing needs to maintain short segments of powerline access routes and reduce vegetation that may compete with powerline operations.	Effects would be outside the Sanpoil project area but would be inside the watershed analysis scale.
Maintenance of State Highway 20	Ongoing	Activities would include sanding, salting during the winter as well as hazard tree removal as needed along the route.	Effects would be outside the Sanpoil project area but would be inside the watershed analysis scale. Management has been ongoing for a very long time and effects are expected to continue to be well represented by the existing condition.
10 Mile Campground Restoration	2018-2020	Planned treatments would include maintaining the site west of the road and east of the road would see removal of infrastructure, removal of fill on the roads, removal of campsites and spur roads accessing sites. A small parking area would be left near the road, and access for fishing would be preserved. Plans also include removal of an outhouse. The area would be revegetated upon project completion.	Long term should result in reduced sediment to the stream, improved riparian vegetation and bank stability by limiting heavy visitor traffic close to the river.
Gibraltar Trail Connections	2019-2022	Some segments of trail approved under	Potential sediment delivery to streams due to a few stream

Project Name/Activity	Timing	Description	Predicted or Ongoing Effects
		the project still need to be constructed mostly on existing travel ways to complete the full loop system. This includes a portion of the trail up to Quartz Mountain.	crossings in the area. Once the full loop trail is completed may see an increase in use.
Pacific Northwest Trail Construction	2027	In two to three years the PNTA committee should have a management plan written for this congressionally designated trail. At that time work would begin to plan, analyze and designate trail routes through this area. Focusing on moving trail alignment off roads where necessary. This work of planning the new route could take 5 years. Finally there may be additional NEPA needed to authorize construction of the trail itself which could take a few years longer. Total time before ground breaking new trail is estimated to be 10 years.	Effects may include potential increase in recreation users including dispersed camping along the route even before trail routes are finalized and construction begins on the last segments.
Firewood Cutting	Present/ongoing	Cutting and removal of dead trees within 150 feet of open roads is allowed. This activity occurs in a few key areas such as McMann Creek throughout the project area.	Firewood cutting may result in a reduction in snags near roadways and may generate increased residual fuel loadings where small branches and limbs are left onsite.
Dispersed Recreation	Present/ongoing	There are 33 mapped dispersed recreation sites along USFS roads where infrequent overnight use occurs.	Recreation may result in localized damage to vegetation and may contribute to the spread of invasive plants.

Appendix B Sanpoil Standard Practices

Table 16. Sanpoil project standard practices

No	Standard Practice
Aquatics	
1	<p>Category 1: Fish-bearing streams: RMA consist of the stream and the area on each side of the stream, extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees,¹ or 300 ft. slope distance (600 ft. total, including both sides of the stream channel), whichever is greatest. It is expected that RMA widths along fish-bearing streams will not be less than described here.</p> <p>Category 2: Permanently flowing, non-fish-bearing streams: RMA consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.</p> <p>Category 3: Constructed Ponds and reservoirs, and wetlands greater than one acre: RMA consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than one acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.</p> <p>Category 4: Lakes and natural ponds: RMA consist of the body of water and the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.</p> <p>Category 5: Seasonally flowing or intermittent streams, wetlands, seeps and springs less than one acre, and unstable and potentially unstable areas: This category applies to features with high variability in size and site-specific characteristics. At a minimum, these RMA should include: The extent of unstable and potentially unstable areas (including earthflows). The stream channel and extent to the top of the inner gorge. The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation or wetland, extending from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.</p>
2	<p>Three Zones of the RMA – These design elements apply to all treatment units and wetlands, springs, seeps, and streams found during the project. The intent is to move vegetation toward the goals set forth in LMP in the RMA while protecting fish habitat and water quality. Treatment in RMA units should be reviewed by the Hydrologist or Fisheries Biologist during presale activities; this review may occur as an office review.</p>

¹ A site-potential tree height is the average maximum height of the tallest dominant trees for a given site class.

	<p>Zone 1 – Immediately around a stream, wetland, or other water body Treatment – 15 foot no treatment buffer. Activities can occur only to enhance fisheries or make watershed improvements. Intent - protect stream banks and do not allow stream bank trees to be removed.</p> <p>Zone 2 –the extent of the riparian vegetation or wet soils, whichever is greater Treatment – no mechanical treatment or pile burning. Hand treatment of fuels may be allowed, prescribed fire would be allowed to creep into this zone, but no active ignitions would occur. Avoid firelines and hose lays that run parallel to stream channels, avoid using foam near stream channels. Intent - limit soil impacts on sensitive wet soils and limit bare areas created by pile burning. Avoid sediment delivery and foam contamination of streams by letting the fire die out in the RMA.</p> <p>Zone 3a –the remainder of the RMA containing upland vegetation where a road occurs Treatment Upslope of Roads- allow unit treatment as prescribed Treatment Downslope of Road – keep machinery back 50 feet from the slope break or inner gorge. Protect all tree and large shrub hardwoods. Retain a portion of conifer species in western hemlock, Engelmann spruce, and western red cedar as appropriate to the disturbance regime. Limit the removal of dominant and co-dominant conifers in the overstory canopy on the south side of streams. Slope is less than 20%, and the area is beyond 50 feet of the inner gorge, allow canopy removal would be less than 25%. Harvest is allowed with consultation with the Fisheries Biologist, Hydrologist, or Soils Scientist. To prevent creating a fuel problem, log with tops attached if possible. If the slope is greater than 20%, no commercial harvest would occur. Apply treatments as per Zone 2 above. If a barrier to the riparian area is breached, windrows would be created between the riparian area and the treatment, or a fence would be installed to keep cattle out of riparian areas. Intent - is to not destabilize the slope break or work on steep side slopes that directly input into streams and to protect the stream channel, enhance the large woody debris within the stream channels and RMA, and prevent increases in water temperature by retaining shade. Intent is also that treatments along streams and wetlands not increase cattle access to riparian areas.</p> <p>Zone 3b –the remainder of the RMA containing upland vegetation where no roads occur within Zone 3. Treatment - In units adjacent to streams, machinery would need to stay back 50 feet from the slope break or inner gorge. Mechanical piling and leave tops attached would be allowed with consultation with the Fisheries Biologist, Hydrologist, or Soil Scientist. Single passes of harvest machinery are allowed under the following conditions: Harvest under winter or summer dry condition or over a slash mat (to reduce bare soil); Slope towards stream is less than 20%; Soil is not erosion sensitive (as identified by the Soil Scientist); Intent - to not destabilize the slope break or work on steep side slopes that directly input into streams.</p>
3	<p>Temporary crossings require dewatering, isolation from flow, or dry conditions to install. Those on fish bearing streams and those that would be in place outside of fish work windows (varies per stream, most restrictive is July 1 to August 31) of one year would require aquatics staff to facilitate Washington Department of Fish and Wildlife (WDFW) Memorandum Of Understanding (MOU) compliance. The streambed and streambank would be restored to pre-project conditions following removal of the crossing.</p>

4	Locate all refueling and servicing sites outside the RMA. The intent is to prevent fuel spills and to minimize activities within the RMA.
5	No direct lighting of prescribed fire in RMA. Fire may be allowed to back into the RMA where fire control measures would cause more impact than the burn. Burn plans would minimize canopy cover loss in RMA and loss of downed large wood near channels.
6	Piles in the RMA would be outside of zones 1 and 2. Piles would be burned during late fall through early spring while fuel moisture levels are high enough to limit fire spread. Raking around large trees and shade tolerant species to prevent mortality is recommended. A minimum of 90% organic material (duff) would remain on the ground in the RMA after pile burning in order to protect soil and minimize sediment delivery to streams. The intent is to minimize the effects of prescribed fire on soil, water quality, and riparian resources. This applies to all burning within the RMA
7	<p>In order to avoid fish entrainments into pumps and to prevent barriers to fish movement, non-emergency fire response and non-emergency pumping of water and construction of associated small sandbag or gravel berm dams with hand tools would include the following:</p> <p>a) The location, pumping rate, and duration of non-emergency water withdrawals will be designed to minimize aquatic impacts. Non-emergency pumping shall not reduce streamflow to the detriment of fish life. Consult the Fisheries Biologist if adequate streamflow levels are in question.</p> <p>b) Any pump used for withdrawing water from fish-bearing waterbodies shall be equipped with a fish guard to prevent passage of fish into the pump. The pump intake will be screened with 3/32 inch or smaller mesh and the screen must have at least one square foot of functional screen area for every cubic foot per second (cfs) of water drawn through it. Screen maintenance shall be adequate to prevent injury or entrapment to juvenile fish and shall remain in place whenever water is withdrawn from waterbodies through the pump intake.</p> <p>c) Temporary gravel berm dams will be constructed of gravels available on-site within the bankfull channel, or of clean, round gravel transported to the site.</p> <p>d) No dirt from outside the bankfull channel will be used to seal the dam and no logs or woody material within the bankfull channel shall be utilized for construction of the temporary dam.</p> <p>e) Temporary sandbag or gravel berm dams will be completely dismantled and the streambed restored to its original condition following completion of withdrawal.</p>
8	The Silviculturist, Fisheries Biologist, and/or Hydrologist will be involved in developing treatment prescriptions in the RMA. The intent is to offer enhanced protection to the more sensitive aquatic areas
9	Parking, staging areas, and landings will be located outside the RMA unless there is no other suitable location. In that case, a Hydrologist or Fisheries Biologist will be consulted on all proposed landing locations within RMA. The intent is to minimize the effects of management activities on soils, water quality, and riparian resources.
10	When removing hazardous trees within the RMA, retain the tree on site and drop it towards the stream. The intent is to protect the stream channel and enhance the large woody debris within the stream channels and RMA. This applies to all hazardous tree removal within the RMA.
11	During project activities, do not create openings by removing or killing trees, openings larger than ½ acre or an opening large enough for camping or parking in RMA. This includes keeping fire severity low when underburning to reduce the potential of killing large patches of trees because firewood gatherers often remove the dead trees and leave openings. The intent is to reduce recreational cumulative impacts to RMA.
12	Wood will not be removed from the stream channels. At least 35 feet of all existing downed trees of 12 inches or greater in diameter, within or overhanging the stream channel would be left in place to meet large woody debris objectives. The intent is to enhance the large woody debris within the stream channels and RMA. This applies to all RMA.

Botany	
13	When herbicide treatment is planned in the vicinity of a sensitive plant population, consultation with a USFS Botanist would be necessary prior to implementation. Typically a no herbicide buffer, approximately 100 feet around any sensitive plant population would be required.
14	The USFS Botanist would provide maps of known populations within the project area to be reviewed prior to each implementation season. Adjustments to treatments would be made if necessary
15	Any sensitive plant populations found prior to or during implementation would be protected using design criteria appropriate for the species. A USFS Botanist would be consulted to determine necessary actions to protect population viability and habitat identified during implementation.
Heritage	
16	Avoid all historic properties during implementation. A minimum 20-meter buffer is required on all sites as established by a certified archeologist. The archeology crew has established a 20-meter flagged buffer around monitored and newly recorded sites. Of sites that were not able to be relocated/located the boundaries have not been flagged. These sites may be discovered during the course of implementation. Personnel must notify the Forest Archeologist if there is an inadvertent discovery of archeological resources outside of the flagged boundary of a site or the discovery of other unflagged archeological resources within a unit boundary. In such an instance, operations are to cease until a certified archeologist can develop mitigations. All equipment needs to stay out of the flagged boundary of sites and trees will be felled away from the property. The Forest Archeologist or qualified Heritage Program personnel will work with presale and fuels to identify sites located within unit boundaries and provide location information to the appropriate individuals.
17	Roads leading into units containing archeological resources that are not to remain open system roads should be closed as soon as possible. Screening vegetation should be left in place to obscure historic sites along such roads during removal of surrounding cover from timber harvest/thinning.
18	Project managers are advised to contact the District Archaeologist or Forest Archaeologist if new cultural resources are discovered or if there are changes in the scope of work and/or project area boundaries.
Invasive Plants	
19	Invasive plants that occur within the project area and on Forest Service routes used to access the project area will be treated prior to any harvest or ground disturbing activities.
20	All equipment that will operate outside the limits of the road prism must be cleaned, in order to remove all mud, dirt and plant parts, before entering NFS Lands. Equipment must also be cleaned when moving from one sale area to a different sale area.
21	Treat for invasive plants and complete revegetation seeding in areas of road decommissioning, restoration and closure prior to the roads being made un-drivable.
22	Use only gravel, fill material and rock from certified weed-free sources.
Soils	
23	The total acreage of all detrimental soil conditions should not exceed 20% of the total acreage within the activity area including landings and system roads. The desired outcome is to limit detrimental soil conditions to preserve soil productivity and comply with Region 6 Soil Quality Standards and Guidelines – 2520.98.1 (SQS) and move towards the desired conditions for soils outlines in the Colville National Forest Land Management Plan – 2019 (LMP).
24	Retain fine and coarse organic matter on top of the soil. (FW-STD-SOIL-01) The desired outcome is to maintain sufficient amounts of organic matter to prevent short or long-term nutrient and carbon cycle deficits and to avoid detrimental physical and biological soil conditions. Maintain soil cover amounts to prevent soil erosion, percentages of ground cover

	are detailed in the below table. <u>Colville National Forest LMP – FW-STD-SOIL-01- Effective Ground Cover Standard</u>																		
	<table><tr><th colspan="3">Minimum Percent Effective Ground Cover Post Implementation of Soil Disturbing Activity</th></tr><tr><th>Erosion Hazard</th><th>1st Year</th><th>2nd Year</th></tr><tr><td>Low</td><td>20% - 30%</td><td>30% - 40%</td></tr><tr><td>Medium</td><td>30% - 45%</td><td>40% to 60%</td></tr><tr><td>High</td><td>45% - 60%</td><td>60% - 75%</td></tr><tr><td>Very High</td><td>60% - 75%</td><td>75% - 90%</td></tr></table> <p>Treatment units should be maintained with between 3 to 25 tons per acre of coarse woody material (defined for soil resources as woody material greater than 3 inches in diameter). Specific amounts are defined in FW-DC-VEG-04 and FW-DC-VEG-05. The desired outcome is to reduce soil erosion, maintain, increase soil organic matter for the long term, and promote soil productivity.</p>	Minimum Percent Effective Ground Cover Post Implementation of Soil Disturbing Activity			Erosion Hazard	1 st Year	2 nd Year	Low	20% - 30%	30% - 40%	Medium	30% - 45%	40% to 60%	High	45% - 60%	60% - 75%	Very High	60% - 75%	75% - 90%
Minimum Percent Effective Ground Cover Post Implementation of Soil Disturbing Activity																			
Erosion Hazard	1 st Year	2 nd Year																	
Low	20% - 30%	30% - 40%																	
Medium	30% - 45%	40% to 60%																	
High	45% - 60%	60% - 75%																	
Very High	60% - 75%	75% - 90%																	
25	Adequately drain firelines including machine and hand line. Waterbars would be installed during fire line construction following guidelines in Fireline Waterbar Guidelines for Prescribed Fires (Jimenez, 2013a) and would be described in Elements 5 and Element 9 of the burn plan(s). The desired outcome is to prevent soil erosion from firelines, preserve soil organic matter, and allow for re-vegetation of firelines.																		
26	Excavated skid trails will be repaired in a manner that maintains soil hydrologic function and soil productivity. Repair should decompaction the running surface of the skid trail and re-establish the contour of the slope. Soil cover will be re-established to at least 50%. Site should be evaluated for seeding and/or planting. The desired outcome is to re-establish soil productivity.																		
Special Uses																			
27	Protect through avoidance all authorized improvements (water system, power lines). Trees should be felled away from improvements. Fuels treatment proposed within the area should be planned and implemented to avoid impacts of fire or smoke on PUD power lines. Permit holders should be placed on the project mailing list and be notified when project activities may be occurring near their improvements and be given an opportunity to identify their improvements on the ground (for avoidance during project activities) if the improvements are not readily apparent.																		
28	Abandoned mine adits often provide suitable or occupied habitat for listed species of bats. No adits have been identified in the Sanpoil project area, however, if they are discovered during project layout, notify the Forest Minerals Program Manager and the District Biologist. USFS personnel or contractors do not enter adits under any circumstance. The mine working may contain hazardous conditions such as loose ceiling rock, rotten timbers, flooded tunnels, ore chutes (vertical shafts), and gases. Entry into mine workings should only occur with and after being cleared for entry by a Certified Mineral Examiner.																		
29	By regulation all locatable mining claim comers should be marked on the ground. Mining claim monuments should be protected by avoidance during project activities. Mining Claimants should be placed on the project mailing list to notify them Sanpoil project activities may be occurring near their mining claims.																		
30	If new, locatable mining claims are staked within areas proposed for road construction, timber removal, prescribed burning or other vegetation management, all features that monument comers of those claims should be protected through avoidance. If avoidance is not possible, the owner of the affected claim should be notified so that he/she can re-monument the comer. Sales administrators and/or project leads should contact the Forest Minerals Program Manager to obtain mining claim ownership contact information.																		
Wildlife																			

31	Monitoring of road closures would be needed for five years. If a breach to any road closures were found during that time re-work would be needed for the closure. We would continue to periodically monitor and improve closures as necessary. Improvements to closures could involve moving a gate, re-installing earthen berms on the road entrance, piling slash in the road prism, etc.
----	---

Appendix C Unit Treatment Table

Table 17. Sanpoil unit treatment table.

Unit	Acres	Fuels Treatment	Surface Fuels	Vegetation Treatment (Commercial)	Vegetation Treatment (Noncommercial)	UB
1	152		MPB	CT		
2	42		MPB	CT		UB
3	105		MPB	SPT		UB
5	34		MPB	HSH		
6	144		MPB	CT-O		
7	51		MPB	CT		
8	47		MPB	CT		
9	243				PCT	
10	155				PCT	
11	49				PCT	
12	384				PCT	
13	75		MPB	CT-O		UB
15	29		MPB	CT		
16	43				PCT	
17	68		MPB	CT-O		
20	32		MPB	SPT		
21	15		MPB	CT		
23	39		MPB	CT		
24	241		MPB	CT		
25	41		MPB	CT		
26	58		MPB	CT		
27	19	LFR	MPB			UB
30	134				PCT	
36	65				PCT	UB
37	148		MPB	CT		
38	59				PCT	
39	39				PCT	UB
40	30					UB
41	20				PCT	
42	15		MPB	CT		
43	13	SFB	MPB			UB
44	74	SFB	MPB			UB
46	10		MPB	CT		
47	26		MPB	HSH		
48	55		MPB	CT-O		
49	28		MPB	CT		
50	25				PCT	

51	26				PCT	
52	42				PCT	
53	89				PCT	UB
54	39				PCT	UB
55	29					UB
56	32		MPB	SPT		
57	72		MPB	SPT		
58	87		MPB	CT		
60	51		MPB	CT		
61	10		MPB	CT		UB
62	40		MPB	CT		
63	62				PCT	
64	48		MPB	CT		UB
65	74				PCT	
66	8		MPB	CT		
67	6		MPB	CT		
69	18		MPB	CT		
70	73		MPB	HSH		UB
71	66		MPB	CT-O		
72	7				PCT	
73	64		MPB	SPT		
74	33		MPB	CT		
75	29		MPB	SPT		
77	19		MPB	SPT		
78	88		MPB	CT		
79	32		MPB	CT		
80	39		MPB	CT		
81	35		MPB	CT		
82	52		MPB	CT		
83	55		MPB	CT		
84	24		MPB	CT		
85	170		MPB	CT		
86	211		MPB	CT		
90	54	SFB	MPB			
92	39				PCT	
93	130		MPB	CT-O		
94	49		MPB	HSH		
95	31		MPB	CT		
96	33		MPB	CT		
97	29		MPB	CT		
98	30		MPB	CT		
99	25				PCT	
100	29		MPB	CT		
101	78		MPB	CT		
102	81				PCT	
103	39		MPB	HSH		
104	30				PCT	
105	67				PCT	
106	68		MPB	CT		
107	39				PCT	

108	35		MPB	CT-O		
109	48				PCT	
110	15		MPB	CT		
111	73		MPB	CT-O		
112	44		MPB	CT		
113	37		MPB	SPT		
114	15		MPB	CT		
115	36				PCT	
116	21		MPB	CT		
117	45		MPB	CT		
118	26		MPB	CT		
119	31		MPB	CT		
121	11				PCT	
122	21		MPB	CT-O		
124	45		MPB	CT		
125	44		MPB	CT		
126	23		MPB	CT		
127	40				PCT	
128	16		MPB	CT		
129	55				PCT	
130	35		MPB	CT		
131	29				PCT	
132	49		MPB	CT		
136	7		HPB			
137	46		MPB	CT		
140	53				PCT	
141	12		MPB	CT		
144	59		MPB	CT		
145	40				PCT	
150	33	SFB	MPB/HPB			
158	4				PCT	
159	3		MPB	CT		
160	35		MPB	SPT		
161	79		MPB	CT-O		
162	25				PCT	
163	8				PCT	
164	22				PCT	
165	8				PCT	
166	7		MPB	CT		
167	26		MPB	CT		
169	6		MPB	CT		
170	8		MPB	SPT		
171	8				PCT	
172	24		MPB	SPT		
173	11				PCT	
174	10		MPB	CT		
175	14				PCT	
176	122		MPB	CT		
177	34		MPB	CT-O		UB
178	15				PCT	UB

179	20				PCT	UB
180	20				PCT	
181	9		MPB	HSH		
182	17		MPB	CT-O		
183	4				PCT	
184	68		MPB	CT		
185	58		MPB	CT		
186	47		MPB	CT-O		
187	33		MPB	CT-O		UB
188	21		MPB	CT-O		UB
189	30		MPB	CT		UB
190	5					UB
191	17	SFB	HPB			
192	16					UB
193	21				PCT	
196	26				PCT	
197	9		MPB	CT		
198	20		MPB	CT		
199	24		MPB	SPT		
201	62		MPB	CT		
202	12	SFB	MPB			
203	25		MPB	SPT		
204	56				PCT	
206	28		MPB	CT		
207	9				PCT	
208	8		MPB	CT		
210	6				PCT	
211	45		MPB	CT-O		
214	25		MPB	HSH		
215	85		MPB	CT-O		
217	57		MPB	CT		
219	66		MPB	CT		
220	134		MPB	CT		
221	15				PCT	
222	5		MPB	SPT		
223	17				PCT	
224	25		MPB	CT		
225	34		MPB	CT		
226	4					UB
227	18		MPB	CT-O		UB
228	36		MPB	CT		
229	64	SFB	MPB			UB
230	10	LFR	MPB			
314	32		MPB	CT-O		
338	44				PCT	UB
342	16		MPB	CT		UB
345	31		MPB	CT		UB
360	10		MPB	CT		UB
361	36		MPB	CT		
378	9				PCT	

429	29	SFB	MPB			
445	9		MPB	CT		UB
477	9		MPB	SPT		UB
500	40		MPB	CT		
529	6	SFB	MPB			
530	31					UB
531	29	SFB	MPB/HPB			
532	46		MPB	CT		
533	28					UB
534	16					UB
535	10					UB
536	15	SFB	MPB			UB
537	203	SFB	MPB			
538	33		MPB	CT		
540	187	SFB	MPB			
541	191	SFB	MPB			
542	13	SFB	MPB			
543	12				PCT	
544	36	SFB	MPB			UB
545	2494					UB
546	1491					UB
547	1781					UB
548	26	SFB	MPB/HPB			
549	49	SFB	MPB/HPB			
550	298	SFB	MPB			
551	60	SFB	MPB			UB
552	338	SFB	HPB			
554	26	SFB	HPB			
555	55	SFB	HPB			
557	326	SFB	MPB/HPB			
559	17	SFB	MPB			
560	44	SFB	MPB			
561	790					UB
562	23	SFB	MPB			
563	11	SFB	MPB			
565	19	SFB	MPB			
566	782					UB
568	18		MPB	CT-O		
569	33		MPB	CT		
570	172		MPB	CT-O		